

CEMP-E/ CECW-E Engineer Circular 1110-1-91	Department of the Army U.S. Army Corps of Engineers Washington, DC 20314-1000	EC 1110-1-91 10 May 1999
	EXPIRES 30 June 2001 Engineering and Design TECHNICAL POLICY	
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DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
Washington, DC 20314-1000

EC 1110-1-91

Circular
No. 1110-1-91

10 May 1999


EXPIRATION DATE 30 JUNE 2001
Engineering and Design
TECHNICAL POLICY

1. Purpose. This circular reissues policy requirements originally disseminated by memoranda from the Director of Military Programs, the Chief of Engineering and Construction Division, Directorate of Military Programs, or jointly from the Chiefs of Engineering and Construction Division, Directorates of Military Programs and Civil Works.
2. Applicability. This circular applies to all USACE Commands having design and/or construction responsibility.
3. Distribution Statement. Approved for public release; distribution is unlimited.
4. Scope. The directives provided at the appendices are hereby reissued as current policy and will remain in effect throughout the life of this circular.

FOR THE COMMANDER:

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MILTON HUNTER
Major General, USA
Director of Military Programs

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for Military Construction
(EIRS Bulletin 94-11)



DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

31 JUL 1998

CEMP-EC (415)


MEMORANDUM FOR COMMANDERS, MAJOR SUBORDINATE COMMANDS

SUBJECT: As-Built Drawings

1. Reference Engineering Regulation 415-345-38, 31 January 1993, Transfer and Warranties.
2. As-built drawings (also called record drawings) are an important product provided to a customer, including USACE civil works operations personnel, upon the completion of a construction or renovation project. Customers must have complete, accurate and timely as-built information for proper operations and maintenance, effective warranty enforcement, and future repair and rehabilitation work. Unfortunately, USACE does not have a consistently good reputation regarding as-built drawings. The predominant complaints from customers are that as-built drawings are not provided in a timely manner or in the format required by the customer.
3. To improve customer satisfaction, the enclosed policy on as-built drawings will be implemented for all new projects. Preparation of the final as-built drawings by the construction contractor is required for military projects and preferred for civil works projects. This policy will be permanently incorporated in the revision of the referenced regulation later this year. Also, the Huntsville Engineering and Support Center is developing a guide specification on Contract Closeout Procedures which will address as-built drawings in conformance with the enclosed policy.
4. Request that you emphasize in your command the importance of providing timely and quality as-built drawings to our customers. Also, ensure distribution of this memorandum to Programs and Project Management, Engineering, Construction and any other concerned functional elements.
5. HQUSACE points of contact are Don Evick, CEMP-EC, 202-761-1053, and Ken Buck, CECW-OC, 202-761-8833.

FOR THE COMMANDER:

Encl


MILTON HUNTER
Major General, USA
Director of Military Programs

CF: All District Commanders

USACE POLICY ON AS-BUILT (RECORD) DRAWINGS

1. Method of Preparation for Military Projects. The construction contractor will prepare the final as-built drawings, whether in manual or CADD format. There are many advantages to this method. Only one party is responsible for the overall as-built drawing process, which reduces the likelihood for mistakes and misunderstandings. Timeliness and quality can be enforced through the construction contract clauses and payment process. The final as-built drawings can be prepared after the completion of each phase of the construction. Finally, the cost of preparing the final as-built drawings is absorbed in the overall construction contract price. The separate line item cost for the preparation of as-built drawings in the Current Working Estimate will be eliminated.
2. Method of Preparation for Civil Works Projects. The preferred method of preparing the final as-built drawings is by the construction contractor. The management plan for the project must justify the preparation of the final as-built drawings by any other method, such as by in-house personnel. Two such exceptions are emergency construction and operations work performed with hired labor. (This policy supercedes the instruction in ER 1110-2-1150, 31 March 1994, Engineering and Design for Civil Works Projects, paragraph 12.g, that Engineering will prepare the final as-built drawings. ER 1110-2-1150 will be revised in the future to conform with this policy.)
3. Customer Coordination. The method of producing the as-built drawings and their format will be discussed with the customer at the beginning of a project, reflected in the Memorandum of Understanding with the customer (if applicable) and the management plan for the project, and confirmed with the customer before issuing the construction solicitation. If CADD as-built drawings are required, their specific format and media must be agreed to by the customer and reflected in the design statement of work. The latest version of the CADD standards developed by the Tri-Service CADD/GIS Technology Center should be used, unless a non-Corps customer specifically desires otherwise.
4. Working As-Built Drawings. The specifications will require the construction contractor to maintain a current record of the work as actually constructed in the form of working as-built drawings. These working as-built drawings will typically be red-line mark-ups of two sets of the construction plans (one for use by the contractor and one for use by the Government), but may be in electronic format if appropriate. The working as-built drawings must be reviewed at least monthly by the Resident Engineer in conjunction with the approval of progress payments.
5. Final As-Built Drawings. The contract specifications will require the contractor's project schedule to show separate activities with realistic payment amounts for preparation of the final as-built drawings after the completion of specific phases of work (foundations, utilities, structural steel, etc., as appropriate for the project). For civil works projects where extensive bid items are used, the cost of the as-built drawings must be specifically attributed to particular bid items. Compliance and delivery of the final as-built drawings will be enforced through the approval of progress payments. Also, the quality of the final as-built drawings will be reflected in the construction contractor's performance evaluation.

Enclosure

USACE POLICY ON AS-BUILT (RECORD) DRAWINGS

6. Transfer to Customer. Interim as-built drawings will be provided to the customer at project transfer. Interim as-built drawings may be a combination of final as-built drawings for early phases of the project (such as foundations, utilities, and structural framing) and red-line mark-ups for later phases (such as electrical, mechanical and communications). The completed final as-built drawings, in the required media, format and quantities, will be provided to the customer within 60 days after project transfer. (The 60-day period satisfies the requirement in Army Regulation 415-15, Army Military Construction Program Development and Execution.) The 60-day period includes time for final drawing preparation by the contractor, Government review, and correction by the contractor.

IMPLEMENTING INSTRUCTIONS - HUD PROGRAMS

Guidance for Executing the
Memorandum of Agreement between
The Department of Housing and Urban Development
and
The Department of the Army

DEFINITIONS

A. Annual Work Plan - A meeting between the Corps of Engineers District Office (COE) and the HUD Field Office (HUD) shall be held annually to determine the Work Plans as required by the Memorandum of Agreement (MOA.) HUD may use information from its annual Risk Assessment to develop the Annual Work Plan.

B. Contract Administration Review means the COE's review of Housing Authority (HA) procurement procedures for professional Architect/Engineer (A/E) and construction services and procuring equipment and materials in accordance with 24 CFR 85.36 and related HUD program requirements. This includes but is not limited to:

determining that the solicitation procedures including advertisement and award, as well as the contract documents satisfy all HUD requirements;

overseeing HA contracts to ensure that the frequency and quality of inspections by the HA's A/E are adequate for contract completion in accordance with the plans and specifications;

assuring contract modifications are: within scope and not already a part of the executed contract (repetitive); essential to the completion of the contract work; and related additive/deductive costs and time extensions are reasonable; and

determining that payments to the contractors adequately reflect the completion status of the contract work and are consistent with the schedule of payments.

C. Deficiency - Nonconformance with contract requirements.

D. Findings - A violation of Annual Contributions Contract (ACC), Regulatory or Statutory requirements.

E. Force Account Labor is labor directly employed by the HA on either a permanent or a temporary basis.

F. HUD's Inspection/Review Procedures are provided in the Monitoring Guidebook dated April, 1993 - Construction Quality Review of Public and Indian Housing. The COE shall use its knowledge and expertise to assure that the construction work meets: the plans and specifications; the Modernization Standards in HUD Handbook 7485.2, as revised; "Guidelines for Evaluation and Control of Lead-Based Paint in Housing"; and the general construction industry performance standards. The COE reports will be in the sample format as attached.

G. Observations - Comments, opinions or recommendations regarding HA and construction performance.

H. Physical Inspection (interim and final) means monitoring the construction and performing designated tasks for assuring good quality of construction. Major tasks include:

reviewing the plans and specifications in preparation for conducting the on-site inspection of a development where work is carried out by contract or force account;

conducting on-site construction inspections to assure compliance with contract documents, modernization and energy conservation standards and other federal requirements;

preparing a report on each inspection including listing of the identified findings, deficiencies, and observations with proposed solutions and recommendations;

discussing the results of the inspection before leaving the site with the HA's Executive Director or designee;

submitting a written inspection report to HUD within fifteen calendar days of the inspection;

recommending to HUD whether a follow-up visit is needed to assure that deficiencies identified have been corrected;

participating in the final inspection as directed by HUD.

I. Plans and Specifications means the documents developed by an A/E for procuring equipment or construction services.

J. Pre-Bid Review - the review of proposed bidding or turnkey documents including plans, specifications, site engineering, feasibility studies, work write-ups, cost estimates, and budgets to assure compliance with the current Federal requirements and free from omissions that may lead to contract modifications during the contract (Bidability, Constructibility, Operability [BOC] Review). This is not applicable to force account labor.

K. Program Reviews - Comprehensive reviews of program requirements for modernization, development, MROP, HOPE VI, TARC et cetera.

L. Risk Assessment - HUD's formal process for prioritizing need for reviewing HAs. HUD may choose to include the COE's participation in this process. HUD may use its Risk Assessment process to develop the Annual Work Plan in conjunction with the COE.

M. Work Order - the document prepared by HUD which identifies specific inspection and review actions to be carried out by the COE staff. It includes the type of work, schedule of work and estimated costs (to be provided by the COE.) At the completion of the work order, the COE's actual costs shall be included on the work order by the COE and both HUD and the COE shall sign off.

II STATEMENT OF WORK

A. The COE under this agreement shall: furnish all materials, equipment, services, and facilities; provide its own transportation; and execute tasks incident to or stated in the work orders and

described in the definitions. When acting as HUD's agent, the COE shall: have right of entry and free access to the development; and inspect all work as directed in the work order (including materials, equipment and fixtures furnished, installed or stored in and about the development.)

B. The COE shall designate a contact person in each of its District offices. The HUD Office of Public Housing Director or designee shall prepare work plans with the assistance of the COE. The work plans shall: be prioritized by HUD; contain the HA programs to be reviewed; contain the developments to be inspected; specify the frequency of inspections; identify tasks to be performed for each inspection/review; and include the estimated cost of the task as provided by the COE. HUD shall be responsible for monitoring the HA where the development(s) are to be inspected according to the work plan schedule.

C. HUD shall prepare and send to the COE a work order quarterly for HAs to be reviewed/inspected on the attached form. The work order shall contain the tasks to be performed by the COE at identified development(s) at a particular HA and the period in which they are to be performed. Tasks typically included in the work order are described in the Section I, DEFINITIONS. Any specific instructions to the COE concerning inspection/review of development(s) shall be put in the comments section of the work order by HUD. The COE shall estimate the cost for conducting the inspections identified in the work order and send it back to the HUD office. The HUD Office of Public Housing Director, after signing the work order, shall deliver or fax it to the COE District Office for accomplishing the requested inspections/reviews.

D. After receiving the work order, the COE shall contact HUD to receive further instructions regarding the contact person on-site and the HA phone number for contacting the HA before inspection/review. HUD shall advise the HA to be inspected to provide a set of the development(s) plans and specifications (where the work is being carried out by contract) to the COE for its review before the on-site inspection. HUD also shall inform the HA of the date and time of the inspection to be conducted by the COE representative after confirmation by the COE. The COE shall review the development(s) plans and specifications furnished by the HA prior to the inspection. For contract administration reviews, HUD shall advise the HA to provide access by the COE representative to all necessary records of the particular project(s) being reviewed. For adequacy of pre-bid reviews, HUD shall advise the HA to provide a set of pre-bid documents in sufficient time for the COE to review before the project is advertised for bids.

E. If HUD determines that it is necessary to make changes to an existing work order, an amended work order may be issued any time following the procedures for issuing a new work order.

F. The COE shall: include in each inspection report any identified safety or health hazard; discuss identified hazards with the HA's Executive Director or designee before leaving the site; immediately notify the HA's Executive Director or designee, and HUD, of any observed safety or health hazards which endanger life or threaten serious injury or property damage.

III FUNDING

- A. Based on the Annual Work Plans determined jointly by the Corps and HUD, HUD Headquarters will provide funds to the Corps Headquarters on a quarterly basis. The funds will be transmitted by Electronic Funds Transfer (EFT). If either agency is unable to complete the transaction by EFT, HUD shall make payment to the Corps by check transmitted in advance of the work being accomplished to CDR HQUSACE (CERM-FC), 20 Massachusetts Avenue NW, Washington, D.C. 20314-1000. The ordering document in accordance with the Economy In Government Act shall be HUD Form 730, "Award/Modification of Interagency Agreement (IAA)," (with attachment). This form is the HUD document required to obligate the funds transmitted to the DA.
- B. Funds received on a quarterly basis from HUD will be distributed to the Corps districts upon receipt in Corps Headquarters of an approved Work Order, signed by both the HUD and Corps representatives.

IV REPORTING

- A. After completion of an inspection/review, the COE shall prepare a report for each of the following in the attached formats:
 - 1. For Physical Inspections, the required report form includes:
 - a. Any deviations from the plans and specifications of executed contracts; any contract modifications which have not been approved or documented; and instances of deviations from the HUD modernization and energy conservation standards and Lead-Based Paint Guidelines;

Any deviations and or deficiencies in construction materials or procedures and recommendations to correct deficiencies;
 - c. Any deficiencies in contract administration and recommendations for immediate and long term corrective measures; and
 - d. Recommendations for follow up inspection(s) to assure that the deficiencies are corrected.
 - 2. For Contract Administration Reviews:

Any deficiencies/irregularities found in the contract administration shall be submitted to HUD within fifteen calendar days of completion of the review. HUD, after review of the report, shall advise the HA of any corrective action required in that project or future projects.
 - 3. For Pre-Bid Reviews:

Any deficiencies of Federal requirements found shall be submitted to HUD within fifteen calendar days of completion of the review. HUD shall review the report and

advise the HA of any corrective action before the project is advertised for bids.

For Program Reviews:

Any deficiencies/irregularities found in the effective implementation of Modernization (CGP, CIAP), HOPE VI and development programs shall be submitted to HUD within fifteen calendar days of completion of the review. HUD shall immediately review the report(s) and advise the HA of any corrective action required within five(5) days.

B. For all inspections/reviews, the COE shall discuss the inspection results and the corrective action required with the HA on-site representative and shall submit the report to HUD within fifteen calendar days of the inspection. HUD shall examine the report for completeness and shall send a copy to the HA with a form transmittal letter to be signed by the Office of Public Housing Director. If warranted, HUD shall contact the COE representative to discuss the areas of concern on the report and advise on corrections. The report shall reach the HA no later than 30 calendar days after the on-site inspection is completed. Within 60 calendar days of the inspection, the HA shall furnish HUD a written report of actions taken or to be taken as appropriate to remedy the findings and/or accomplish the recommendations contained in the HUD-approved COE inspection report. A copy shall be provided to the COE.

C. The COE shall transmit the inspection/review report with a cover letter that identifies the findings resulting from the inspection/review. Deficiencies and observations shall be included in the body of the report. HUD shall review the findings for accuracy and applicability. Discrepancies found by HUD should be discussed with the COE. HUD will create a cover letter to the report that identifies the findings, required corrective actions, and time frames for completing the corrective actions. HUD will transmit the cover letter and report to the HA.

D. The COE Headquarters shall provide HUD Headquarters a national summary report within 60 days after the end of each Fiscal Year summarizing the major defects found during the inspections for each HUD geographic jurisdiction (HUB/Program Center.) The report shall address, but not be limited to, the following categories: conformance of plans and specifications with the HUD modernization and energy conservation standards; adherence to construction schedule; major deficiencies in the construction materials and workmanship; major deficiencies in the contract administration; and recommendations for improvement in carrying out the work.

E. The COE shall submit quarterly and annual financial reports reflecting the funds expended and remaining for each HUD Field Office to the HUD Field Office and HUD Headquarters. HUD Headquarters may rearrange the allocation of funds for each Field Office based on the quarterly reports and the projected need for inspections by each Field Office. The HUD Field Office shall amend its schedules according to the available funds.

F. The COE District Office shall submit to the HUD Field Office monthly reports which document the expense and status of open work orders.

These implementing instructions may be modified or amended only by written, mutual agreement of both parties.

U.S. Department of Housing
and Urban Development

U.S. Army COE of Engineers

Date: _____

Date: _____

MEMORANDUM FOR COMMANDERS, MAJOR SUBORDINATE COMMANDS

SUBJECT: Military Construction Design Review Policy - Technical Review Conducted by Mandatory Centers of Expertise

1. Reference:

a. ER 1110-3-109, 15 July 1992, Subject: Corps-Wide Centers of Expertise Assigned to Major Subordinate Commands and Districts.

b. Memorandum, CEMP-ES, 31 May 1991, Subject: Military Construction Design Review Policy.

2. Mandatory Centers of Expertise (MCX) have exceptional specialized technical capability and have been established by HQUSACE to provide technical support to all USACE Commands involved with Military Construction. The designated services rendered by each MCX to USACE Commands are outlined in reference 1a.

3. Reference 1a requires technical reviews of district designs (in-house and A-E) of Utility Monitoring and Control Systems (UMCS), Intrusion Detection Systems (IDS), Protective Design (PD), Transportation Systems (TS) be conducted by the MCX. Reference 1b delegates to the districts the design review functions previously performed by the Major Subordinate Commands (MSC). To prevent overlap of design review efforts, reduce the cost of the design, and provide the highest quality product to our customers, each district is to include the design review of reimbursable projects requiring special technical expertise by the pertinent MCX as follows:

a. For OMA and Air Force projects, each district's request for design funds should also include in their proposed in-house review costs, funds for MCX technical review. MCX reviews of MCA projects are central funded by HQUSACE as explained in reference 1a. The funds for MCX review need not be in addition to the total design funds, but should be considered part of the design funds designated for in-house technical review. The funds for MCX review shall be transferred to the MCX,

b. Each USACE design office having design responsibility involving those technical areas identified above is responsible for contacting the pertinent MCX. Review services, schedules and fees will be worked out between the design office and the MCX. Each MCX will be required to provide a schedule of MCX review fees and will be part of their program management plan. This list of fees will cover labor costs for all phases of design reviews, and limited travel and labor

CEMP-ET

SUBJECT: Military Construction Design Review Policy - Technical Review conducted by
Mandatory Centers of Expertise

expenses for selected review conferences. This method of design review process is a
cost-effective means of assisting districts in providing our customers both high quality and
timely service.

4. Military Programs point of contact for questions or comments is Mr. Mohan Singh,
CEMP-ET, 202-272-0211,

FOR THE COMMANDER:

/s/

PAT M, STEVENS IV
Brigadier General, USA
Director of Military Programs

CF:
CEMRD-ED-TT
CEMRO-EN-PD
CEHND-ED-ME

CEMP-ET (1110)/S/ 20 November 1995

MEMORANDUM FOR COMMANDERS, MAJOR SUBORDINATE COMMANDS

SUBJECT: Disposition of the Military Programs Mandatory Centers of Expertise

1. Reference:

a. CEMP-ZK Memorandum dated 5 December 1994, Subject: Adjusting to Downward Trend in Military Workload.

b. CECG Memorandum dated 19 June 1995, Subject: Adjusting to Downward Trend in Military Workload -- Decisions on Corporate Direction.

2. Reference 1.a. initiated a study of military programs in response to a downward trend in military workload. As part of this study, the need for all the military programs mandatory centers of expertise (except OEW and HTRW) were to be re-validated. The centers involved in the study were:

- a. Army Range and Training Land Program
- b. Transportation Systems
- c. Utility Monitoring and Control Systems
- d. Intrusion Detection Systems
- e. Protective Design

3. Based on the initial input from the divisions and districts, the HQUSACE study team developed and presented a set of options to the USACE Commander for corporate level decision. The USACE Commander, by memorandum to all Major Subordinate Commands, reference 1.b., made several decisions on the direction military programs should take in adjusting to future workload reduction. His decision guidance on the mandatory centers, paragraph 3.e. of that memorandum, tasked the Military Programs Directorate to review the requirements for the above five mandatory centers and establish a fee-for-service funding system to become effective by the end of FY96.

CEMP-ET

SUBJECT: Disposition of the Military Programs Mandatory Centers of Expertise

4. A review of the mandatory centers of expertise was completed and results included in report "Adjusting to the Downward Trend in Military Workload" dated 28 July 1995; reference 1.c. The MSC and district commands have reviewed the report and comments regarding the centers of expertise have been appraised with appropriate action being taken. Each of these centers provides a unique or exceptional technical capability in a highly specialized subject area. Many of these military unique engineering expertise are not readily available from the private sector and must be retained within the USACE. These centers have been created in response to either a directive from higher authority or a request from the customer. In either case, the underlying reasons were the same, i.e., no central point of contact, expertise either non-existent or scattered throughout USACE, and poor track record in executing contracts which included these unique technical requirements. These reasons are just as valid now as they were then. With the continued pressure on manpower authorizations, it is not feasible to maintain these highly specialized expertise in all districts, and the centers provide the only economical means of responding to the needs of the Army and our customers.

5. Based on the information presented to me, I have decided to retain the above five centers and continue their mandatory status. The centers will be funded primarily through fee-for-service beginning with FY97, with some minimal funding by HQUSACE for providing direct support to this Directorate. By separate memoranda, the centers' assigned commands will be given specific guidance on authorized FTEs and funding levels from HQUSACE.

6. All USACE commands are required to use the designated services provided by these centers as stipulated in applicable documents. I ask each MSC Commander to take personal interest in ensuring that their district utilize these centers of expertise at the earliest stages of design or review in order to get the full benefits of their knowledge and experience and avoid future cost growth.

FOR THE COMMANDER:

/S/

ALBERT J. GENETTI, JR.
Major General, USA
Director of Military Programs



DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

6 AUG 1998

CEMP-ET (1110)

MEMORANDUM FOR COMMANDERS, MAJOR SUBORDINATE COMMANDS

SUBJECT: Military Construction Design Review Policy for Airfield, Railroad and Roadway Projects

1. References:

- a. ER 1110-1-8158, 16 January 1998, Subject: Corps-Wide Centers of Expertise Program
- b. Memorandum, CEMP-ET, 12 June 1997, subject as above.

2. The above references require technical reviews of Corps designs (in-house and A-E) of airfield, railroad and roadway projects be conducted by the USACE Transportation Systems Mandatory Center of Expertise (TSMCX). This policy has proven to be a highly efficient and cost effective way to supplement district in-house design review capabilities and helps the districts provide our customers with a quality product. A review by the TSMCX also facilitates the implementation of the most current advancements in technology related to transportation systems.

3. This memorandum clarifies the policy set forth above and updates the TSMCX design review fee schedule:

- a. All airfield and railroad project designs, regardless of funding type, require TSMCX review. This includes Army, Air Force and Navy projects, Foreign Military Sales (FMS) projects, Host Nation (HN) projects, Combined Defense Improvement Projects (CDIP) and support for others (SFO) projects. Airfield projects include airfield pavements, aircraft hangar floors, airfield lighting, marking and navigational aids (NAVAIDS), hydrant fuel projects (pavements portion only) and any facility located within the airfield operational airspace.
- b. All projects, regardless of funding type, where the roadway portion is over \$3,000,000 also require TSMCX review. This includes Army, Air Force, Navy, FMS, HN, CDIP and SFO projects. Roadway projects include roads, streets, non-organizational parking areas, organizational vehicle parking areas, vehicle and tank hardstands, tank trails and any pavement facility in support of transportation vehicles. Roadway projects under \$3,000,000 will be reviewed only when requested by the design district or the customer.
- c. All TSMCX review efforts will be project funded and reimbursed by the design district.

CEMP-ET

SUBJECT: Military Construction Design Review Policy for Airfield, Railroad and Roadway Projects

d. To implement the requirements for TSMCX review, the Product Management Plan for qualified projects shall reflect this requirement and provide appropriate effort and funding.

4. For projects requiring TSMCX review, two copies of all planning and design documents (project booklets, DD Forms 1391, plans, specifications and design analyses) should be sent to the following:

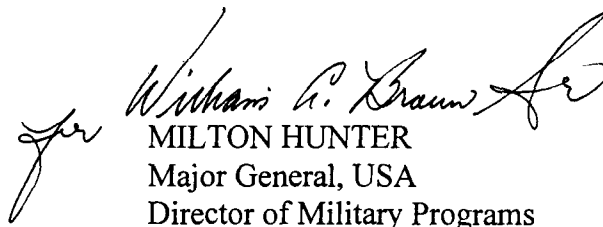
U.S. Army Corps of Engineers
Transportations Systems Center
215 North 17th Street
Omaha, NE 68102-4978
Phone: 402-221-7260
FAX: 402-221-7261

5. A list of average review fees based on the Programmed Amount is enclosed. This list can be used as a guide for the preparation of a design budget. The fees cover the labor review costs for all phases of design. However, since each project is unique in size and complexity, the actual costs for design reviews and the length of time for doing the reviews should be negotiated between the design district and the TSMCX. Design-build projects and airfield projects with both pavements and lighting/NAVAIDS will generally require higher review fees. Additional funding for travel and labor will be required for review conferences and site visits, when requested by the design district or customer. Funds shall be transferred to the TSMCX with the first set of review documents.

6. The Military Programs point of contact for questions or comments is Mr. Gregory W. Hughes, CEMP-ET, (202) 761-4140.

FOR THE COMMANDER:

Encl


MILTON HUNTER
Major General, USA
Director of Military Programs

CEMP-ET

SUBJECT: Military Construction Design Review Policy for Airfield, Railroad and Roadway Projects

CF:

COMMANDER,

AMC, ATTN: AMCEN

TRADOC, ATTN: ATBO-G

FORSCOM, ATTN: AFEN

CENWO-ED-TX (TSMCX)

HQ AFCEA/ENC, ATTN: Mr. Greene

USAASA, ATTN: MOAS-AI (Mr. Perron)

DAIM-FDF-B, ATTN: Mr. Black

COMMANDER,

All Regional Offices, Districts and Centers

ATTN: Engineering Division and Program/Project Management Division

AVERAGE REVIEW FEES

<u>Programmed Amount:</u>	<u>Basic Review Fee:</u>
Less than \$1,000,000	\$3,500
\$1,000,000 to \$2,500,000	\$4,500
\$2,500,000 to \$5,000,000	\$6,000
\$5,000,000 to \$7,500,000	\$7,000
\$7,500,000 to \$10,000,000	\$8,000
\$10,000,000 to \$20,000,000	\$10,000
Over \$20,000,000	Contact TSMCX

NOTES:

Basic Review Fee. Review fees are based on the airfield, road or railroad portion of the project only. For example, for a \$20M hydrant fuel project which includes \$2M of airfield paving, the basic review fee would be \$4500.

Design-Build. Design-build projects will require approximately 100% higher review fees depending on the size, scope and complexity of the project. Design-build contractors are usually not familiar with specific DOD requirements, therefore several submittals and reviews are required to verify that design criteria is met.

Lighting/NAVAIDS. Airfield projects which include both pavements and lighting/NAVAIDS will require higher review fees depending on the scope of the airfield lighting/NAVAIDS portion of the project. Projects with major rehabilitation or new airfield lighting systems and electronic NAVAIDS (ILS, PAR, etc) will require approximately 75% higher review fees.

Additional Reviews. Review fees are based on two reviews, preliminary design and final design. Additional reviews (60%, etc) will require approximately 35% higher review fees.

Conferences/Site Visits. Additional funding for labor and travel will be required for review conferences and site visits, when requested by the design district or customer.

Design Budget. The above fees should be used as a guide for the preparation of a design budget. Actual fees for design reviews should be negotiated between the design district and the TSMCX.



DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

6 AUG 1998

REPLY TO
ATTENTION OF:
CEMP-EC (1110)

MEMORANDUM FOR COMMANDERS, MAJOR SUBORDINATE COMMANDS

SUBJECT: TSMCX Technical Support During Airfield Pavement Construction

1. References:

- a. Construction Bulletin No. 98-2, CEMP-EC, 2 March 1998, subject as above.
- b. ER 1110-1-8158, 16 January 1998, Subject: Corps-Wide Centers of Expertise Program.
- c. Memorandum, CEMP-ET, 12 June 1997, Military Construction Design Review Policy for Airfield, Railroad and Roadway Projects.

2. The USACE Transportation Systems Mandatory Center of Expertise (TSMCX) is available to provide technical support for all aspects of airfield pavement construction per references 1.a. and 1.b. above. The TSMCX is involved with the technical review of all Corps designed airfield projects (1391s and preliminary design through development of final plans, specifications and design analysis) per HQUSACE policy in reference 1.c. above. Personnel in the TSMCX are familiar with the technical requirements and intentions of airfield designs and have expertise in airfield pavement projects.

3. The TSMCX is available to assist field offices to develop an on-site team experienced in airfield pavement construction. This would be accomplished as follows:

- a. The TSMCX Indefinite Delivery Type (IDT) contracts or Corps temporary duty (TDY) personnel could be used by field offices to supplement in-house staff. The TSMCX has an IDT contract for Construction Management of Airfields and Roadways Worldwide and two IDT contracts for Design and Evaluation of Airfields and Roadways Worldwide. These IDT contracts can be used to provide a full range of Quality Assurance (QA) inspection and laboratory testing services. In addition, a list of Corps of Engineers personnel who have experience in constructing airfield pavements and are available for TDY can be provided by the TSMCX.

- b. Personnel from the TSMCX are available to provide an on-site training seminar for the Corps Quality Assurance (QA) staff and the contractor's construction staff on how to construct quality airfield pavements. This seminar can be incorporated into the partnering meeting, and usually takes 1 to 1 1/2 days; depending on the scope of the construction project. The seminar reviews both good and bad paving practices and highlights items critical to achieving good pavement performance.

CEMP-EC

SUBJECT: TSMCX Technical Support to the Field During Airfield Pavement Construction

c. The TSMCX is available to provide technical consulting to construction field offices by answering questions via phone, fax or E-mail at any time during the project. Home phone numbers of selected TSMCX staff and TSMCX consultants will be available to provide technical support on weekends, when necessary.

4. Once construction starts, the TSMCX is available for review of construction submittals and can make site visits to assist field office personnel in the start up of critical operations such as concrete paving, asphalt paving, pavement removal, joint sawing/sealing, drainage layer construction, full depth and partial depth patching, airfield lighting and navigational aid systems. Reference 1.a. provides additional information on the various services available from the TSMCX during airfield pavement construction.

5. A list of average fees for typical TSMCX technical support during construction is enclosed. This list can be used as a guide for the preparation of a construction support budget. Since the scope of TSMCX technical support services varies with the size and scope of the project and specific needs of the field office involved, the TSMCX should be contacted for further information on scope and cost of construction support services. They can be reached at:

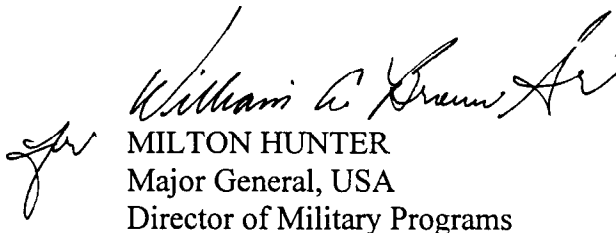
U.S. Army Corps of Engineers
Transportations Systems Center
215 North 17th Street
Omaha, NE 68102-4978

Phone: 402-221-7260
FAX: 402-221-7261
E-mail: terry.w.sherman@usace.army.mil

6. The Military Programs point of contact for questions or comments is Mr. Stanley G. Green CEMP-EC, (202) 761-0206.

FOR THE COMMANDER:

Encl


MILTON HUNTER
Major General, USA
Director of Military Programs

CEMP-EC

SUBJECT: TSMCX Technical Support to the Field During Airfield Pavement Construction

CF:

COMMANDER,

AMC, ATTN: AMCEN

TRADOC, ATTN: ATBO-G

FORSCOM, ATTN: AFEN

CENWO-ED-TX (TSMCX)

HQ AFCESA/CESC, ATTN: Mr. Greene

USAASA, ATTN: MOAS-AI (Mr. Perron)

DAIM-FDR, ATTN: Mr. Nickell

COMMANDER,

All Regional Offices, Districts and Centers

ATTN: Construction Division and Engineering Division

Average TSMCX Technical Support Fees

Use of IDT Contracts	No Cost*
Paving Seminars	\$3800**
Review of Construction Submittals	
Most submittals	1 - 3 hrs
PCC and ACC Mix Designs	8 hrs
Site visits	
3 day trip	\$2000***
4 day trip	\$2500***
5 day trip	\$3200***
Miscellaneous Consulting	\$80/hr

* No cost for use of IDT unless the TSMCX administers the delivery order

** Cost of paving seminars plus travel and per diem

*** Site visits are per person plus travel and per diem and include an outbrief. Trip reports, if requested, would be extra.

Note: Submittal reviews and miscellaneous consulting are based on \$80/hr.



DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

18 JUL 1995

CEMP-ET (1110)
CECW-ED

MEMORANDUM FOR Commanders, Major Subordinate Commands,
ATTN: Directors of Engineering and
Technical Services

SUBJECT: Submittals Required by Engineering Divisions in Contract
Plans and Specifications

1. During the recent Engineering and Construction Chiefs Conference, an issue was raised by Construction concerning the amount of submittals which the plans and specifications require the contractors to submit. The concern is driven by the fact that funds are limited, and that it is doubtful whether Engineering actually has the time to review all the submittals.

2. We recognize that our designers ask for submittals as a means of ensuring the quality of the project. This is certainly true when submittals are extensions of design or when they contain information critical to safety, construction execution, or proper operation of completed project. However, in today's environment, where Construction's quality assurance inspection and Engineering's site visits compete with submittal reviews for the same dollars, we need to balance these activities to get the most out of our limited funds. The districts' Engineering Chiefs should discuss this issue with their design staff and take appropriate steps to ensure that only essential submittals are included in future contracts. They should also ensure that sufficient funds are provided for designers' site visits and for providing engineering support during construction.

3. We have reviewed applicable HQUSACE policies and regulations dealing with this subject and have not noted any requirements which would inhibit your flexibility in this regard. Should your interpretation of these documents indicate otherwise, please notify this office so that necessary clarifications can be made. Points of contact for this action are Ray Navidi for Military Programs and Don Dressler for Civil Works.

DOUGLAS J. KAMIEN, P.E.
Act. Chief, Engineering Division
Directorate of Civil Works

RICHARD C. ARMSTRONG, P.E.
Chief, Engineering Division
Directorate of Military Programs

CF:
District Commanders, ATTN: Chiefs, Engineering Divisions



DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

29 JAN 1996

REPLY TO
ATTENTION OF:

CEMP-ET (1110)

MEMORANDUM FOR Commanders, Major Subordinate Commands,
ATTN: Directors of Engineering and
Technical Services

SUBJECT: Engineering Considerations and Instructions (ECI) for
MILCON Projects

1. Delivery of quality projects to our customers is our basic mission strength. It takes the collective efforts of many to fulfill this responsibility; however, Engineering and Construction are two elements whose performance have a direct bearing on the quality of our projects and thus on the level of customer satisfaction. It is, therefore, imperative that we convey to Construction Division complete and accurate information on our designs. The plans and specifications are the vehicle for turning our designs into reality and they contain the information needed to construct the project as designed. In certain situations, it would be desirable to provide additional information to Construction field personnel to ensure they have all the tools they need to construct quality projects.


2. Effective immediately, Engineering Division is required to prepare an Engineering Considerations and Instruction (ECI) document for certain MILCON projects. As a general rule, the ECI should be reasonably short - no more than five pages - and should be prepared for those projects determined by the Chief of Engineering Division as requiring special attention. This document is to be provided Construction Division prior to contract award.

3. The ECI will be a brief document outlining the engineering considerations used to formulate and design the project. The document should include discussions on why specific designs and material sources were selected, features which may require special attention, any particular user requirements, and other project-specific information deemed useful to provide the field personnel the insight and background necessary to review contractor proposals and resolve minor construction problems without compromising the design intent. The ECI should also include a schedule of visits to construction site by design personnel.

CEMP-ET

SUBJECT: Engineering Considerations and Instructions (ECI) for
MILCON Projects

4. It should be noted that the ECI is not a contractual document, not intended to supplement the plans and specifications, nor should it be in conflict with the contract requirements. Point of contact for this action is Mr. Ray Navidi, CEMP-ET, (202) 761-0223.


KISUK CHEUNG, P.E.
Chief, Engineering Division
Directorate of Military Programs

CF:

District Commanders, ATTN: Chiefs, Engineering Divisions



DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CEMP-ET (1110)

24 MAR 1997

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: USACE Technical Group on Roof Design and Construction

1. Reference memorandum, CEMP-ET, dated 7 March 1997, Subject: Roofing Design and Construction Issues - Policy Guidance.
2. The referenced memorandum delineated the roofing design and construction problems we have been experiencing and requested you to take certain measures that are within your purview to improve performance. You were also informed that we will be taking steps to address these problems.
3. One of our initiatives is the creation of an electronic bulletin on Internet linking our network of experts throughout the Corps. The bulletin will be used to make standard details available to everyone, disseminate information, and provide a forum for information exchange. The purpose of the subject group will be to provide oversight for the implementation of the electronic bulletin and setting overall direction for its contents. The group will also assist in establishing requirements for development of technical criteria and will provide a national focal point for the Corps and industry.
4. The success of this effort is directly attributed to the caliber of the group members. We have selected an interdisciplinary group of experienced individuals involved with roof design and construction. The proposed members are as follows:

Bob Wortham, CESWF	Construction
Ervell Staab, CEMRD	Structural
Larry Seals, CEORD	Structural
Peter Lam, CENPA	Structural
Rich Lewis, CEMRO	Architectural
Dave Marquardt	Architectural
Marion Harrison, CESAS	Architectural
Larry Cozine, CEORL	Architectural
Tom Verdel, CESWT	Architectural
Clay Thames, CESAM	Mechanical
Chris Hinton-Lee, CEMP-EM	Architectural
Jeff Hooghouse, CEMP-EA	Architectural
Dan Chen, CEMP-ET	Structural
John Reiley, CEMP-CE	Construction

24 MAR 1997

CEMP-ET

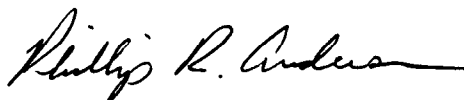
SUBJECT: USACE Technical Group on Roof Design and Construction

These individuals, with their extensive experience with various roofing systems, provide a good cross section of the geographical areas that the Corps serves.

5. The investment of time is expected to be between five and 10 days per person annually. The group may be expected to meet once a year; however, electronic media will be used to the maximum extent possible to reduce travel. Your cooperation in making these experts available is very much appreciated.

6. My point of contact is Mr. Ray Navidi, CEMP-ET, (202) 761-0223.

FOR THE COMMANDER:



PHILLIP R. ANDERSON
Brigadier General, USA
Director of Military Programs

DISTRIBUTION:

COMMANDER,
MISSOURI RIVER DIVISION
OHIO RIVER DIVISION
SOUTHWESTERN DIVISION
NORTH PACIFIC DIVISION
SOUTH ATLANTIC DIVISION
NORTH PACIFIC DIVISION

CF:

COMMANDER,
FORT WORTH DISTRICT
ALASKA DISTRICT
SAVANNAH DISTRICT
LOUISVILLE DISTRICT
TULSA DISTRICT
MOBILE DISTRICT
OMAHA DISTRICT



DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CEMP-E (1110)

26 July 1996

MEMORANDUM FOR COMMANDERS, MAJOR SUBORDINATE COMMANDS

SUBJECT: Design-to-Cost

1. It has been brought to my attention that there is a wide-spread problem with our Air Force project designs going over the Programmed Amount (PA). The problem is compounded when our districts neglect to identify and highlight cost problems during the initial phases of the design process.
2. Although this concern was highlighted by the Air Force, it should be addressed during the project definition phase of all of our Corps projects. Only recently during a trip to the Pacific and Far East, General Lorber, Commanding General, PACAF, expressed concern about the Corps poor performance in matching the costs established during the initial design with the actual project costs.
3. In order to address this concern, we must place more emphasis on establishing a better working relationship between our designers (In-House or A/E), cost engineers and customers. They should work together as a team, starting as early as the authorization /appropriation phase and continuing this relationship throughout the construction life of the project. We must work with the customer to ensure that the design cost represents the actual scope of the initial programming estimate.
4. It is recognized that, in a real world situation, changes to project scope may be inevitable, and we must be responsive and sensitive to our customers' needs. When these situations occur, you must formally discuss the ramifications with your customer and establish an understanding as to the cost and schedule impact, much the same way that A-Es conduct business. This is the centerpiece of a new design funds management system called "Assured Pricing" which will be tested in FY97 at two districts and implemented Corps-wide in FY98.
5. The district commanders are personally responsible for enforcing this procedure and holding functional chiefs accountable for their performance.

FOR THE COMMANDER:

ALBERT J. GENETTI, JR.
Major General, USA
Director of Military Programs

CF:
Commanders, District Commands



DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CEMP-ET (1110)

20 Jan 97

MEMORANDUM FOR Commanders, Major Subordinate Commands,
ATTN: Directors of Engineering and Technical Services

SUBJECT: Roofing Design and Construction Issues - Policy Guidance

1. Roof repair and maintenance is one of the most costly items in the Army's O&M budget. Our customers are becoming increasingly concerned with the quality problems associated with new construction and maintenance problems of existing roofs. To address the concerns of our customers, we have initiated a study to find the root cause(s) of the problem and take appropriate action for improvements.

2. A workshop was held in Washington, D.C. on 28-30 January 1997 to kick off this study. The purpose of the workshop was to define the problem and exchange ideas for addressing customer concerns. The workshop was attended by representatives from several districts and divisions, CECERL, CECRRL, CECPW, ACSIM, installation DPWS, and various roofing industry associations. Feedback from the installations, along with the districts' experiences and industry's perspective, provided an excellent means of identifying areas where improvements are needed. With assistance from our experts in the districts and divisions, and in partnership with industry, we will be working areas needing attention and will issue new or revise appropriate criteria and/or guidance. As this process will require some time, a few issues dealing with processes need immediate attention and corrective measures should be implemented at once.

3. The issues outlined below are self-explanatory. Some, if not all, of the problems may have an understandable explanation such as time constraint, scarce funding, or lack of human resources. However, we feel it is within your purview to take appropriate steps to remedy these shortcomings.

a. Completeness of contract drawings -- There was universal agreement that districts are increasingly skimping on roof design details. This situation has become so prevalent that industry has coined a phrase for it: "RFO" - Roofer Figure Out! Originally, this practice may have been started in order to assure a generic design, but apparently it has gone too far. Drawings must have sufficient details to clearly convey required design features. The scope of work for A-E contracts must specify this requirement.

b. Design review -- It is our understanding that design packages are sometimes submitted for advertisement without proper reviews at various stages. A complete review of the submittals and

CEMP-ET

SUBJECT: Roofing Design and Construction Issues - Policy Guidance

the completed plans and specifications by Engineering Division is required. This is not to be mistaken with the BCOE review which is a separate and distinct requirement. The Louisville District has formed a roofing committee made up of highly qualified roofing specialists from Engineering and Construction to review all roofing designs. This has been very successful in improving the District's design and construction quality, and you may wish to explore establishing similar groups in your district.

c. Adherence to the Guide Specifications -- A task force comprised of district and division experts, in close coordination with roofing industry, worked for several years to develop the guide specifications for the Standing Seam Metal Roof (SSMR) system. With the exception of some "tweaking" on warranties and submittal requirements, which was surfaced during the workshop, this guide specification is a workable document. Yet, we constantly hear about some districts not adhering to this document and relaxing some of its requirements for various reasons. We have an effective way for the districts to raise questions or propose changes to our criteria documents through criteria feedback system (Form 3078). The SSMR task force is in the process of revisiting the guide specifications for the needed changes and any comments should be submitted as soon as possible. Unless this avenue is used, the guide specifications are to be followed.

d. Substitution during construction -- No substitution or deviations of roofing systems or their components is to be considered during construction without the knowledge, evaluation, and approval of the original designers. All submittal reviews will be done by the designers or the district resident expert.

e. Construction surveillance -- On complex roofing projects, the district must provide adequate/enhanced quality assurance during construction. This may require the allocation or resources necessary to maintain appropriate levels of presence at the site. The district must also assure that the contractor's organization is adequate to provide effective quality control inspection during roof installation.

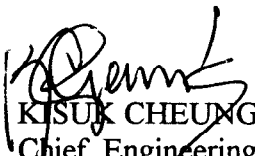
4. As one of the first steps in addressing the roofing concerns, we are arranging for a Corps-wide network of expertise. The purpose is to create a rapid means for exchanging ideas, and sharing experiences and lessons learned. An electronic bulletin using the Corps Groupwise or Internet devoted to roof design and construction issues will be established for linking these individual experts throughout the Corps. This will be a multi-disciplinary network made up of Architects, Civil and Structural Engineers from Engineering and Construction Divisions of the districts and divisions. Request you furnish the name(s) of individuals from your office not later than 12 March 1997 for inclusion in the distribution list. Once we have identified and established this network of experts, we will form various working groups to assist in revising and/or developing criteria for different roof systems.


CEMP-ET

SUBJECT: Roofing Design and Construction Issues - Policy Guidance

5. Military Programs points of contact are Mr. Ray Navidi, Engineering, (202) 761-0223, and Mr. John Reiley, Construction, 202-761-0204.

FOR THE DIRECTOR OF THE MILITARY PROGRAMS:


KISUK CHEUNG, P.E.
Chief, Engineering Division
Directorate of Military Programs


CHARLES R. SCHROER, P.E.
Chief, Construction Division
Directorate of Military Programs

CF:

District Commanders, ATTN: Chiefs, Engineering Divisions

District Commanders, ATTN: Chiefs, Construction Divisions



DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

05 SEP 1997

CECG (1110)

MEMORANDUM FOR COMMANDERS, MAJOR SUBORDINATE COMMANDS,
REGIONAL OFFICES AND CENTERS

SUBJECT: Force Protection for MILCON Projects

1. Earlier this year, the Chief of Staff, Army, asked me about our process for including force protection design features into our projects. Specifically, GEN Reimer stated, "I want to make sure for each building that is designed, we at least go through the decision process of designing for Force Protection or not."
2. I realize that the requirements originate from installations and MACOMs and they are reported to us through the programming document, Form 1391, which provides a basis for our design. However, checking further into the process, we discovered some weaknesses and have taken steps to make sure Force Protection measures are given proper consideration during project planning phases. In addition to the certification by the installation Provost Marshall/Security Officer, the 1391 process has been modified to require signature by the DPW certifying that security measures have been considered in accordance with the TM 853 series of manuals on security engineering. We have also arranged for the automatic referral of the 1391's to the Electronic Security Center and the Protective Design Center for their review.
3. As the design and construction agent for the Army, we can play a significant role in ensuring force protection is given proper consideration in MILCON projects by carefully reviewing the programming documents to verify that force protection has been considered. I want each of you to ensure that your designers and project managers have the necessary training and awareness of force protection issues to support our customers in addressing their force protection concerns. Through our district staffs, the centers of expertise, and our laboratories, I am certain we have the resources and expertise to support the Army's force protection needs.
4. The process we have in place will work as long as requirements are clearly delineated by qualified individuals working in concert with us, i.e., vulnerability assessment and threat analysis have been performed, security requirements have been identified and their costs have been reflected in the programming documents. If there is a weak link in the process, it is when force protection requirements are not identified by installations or MACOMs in the programming documents, or when requirements are deleted in later phases of design due to funding constraints and we do not place emphasis on the oversight/omission in the review process.
5. The installation commanders are ultimately responsible for the protection of their troops and I want to ensure they are provided the opportunity to be directly involved in the decision process.

CECG

SUBJECT: Force Protection for MILCON Projects

To provide this command emphasis, I direct that MSC and district commanders establish a formal procedure for maintaining dialogue with the customer at command level to verify that decisions are fully staffed and documented. In the recent Senior Leaders Training Conference, GEN Reimer stated that Force Protection is the most important challenge facing the Army. I wholeheartedly agree with this statement and want to do everything within our power to ensure the safety and security of our soldiers, civilians and their families.

6. My point of contact for Force Protection and Security Engineering matters is Mr. Ray Navidi in the Military Programs Directorate, 202-761-0223.



JOE N. BALLARD
Lieutenant General, USA
Commanding

CF:
COMMANDERS, DISTRICTS
DAIM-ZA



DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CEMP-EA

31 MAR 1993

COMMANDER'S POLICY MEMORANDUM #7

SUBJECT: Comprehensive Interior Designs

1. The Vice Chief of Staff, Army has placed priority on providing quality living conditions for our soldiers wherever stationed. While this initial thrust to improve the quality of interior environments is directed at barracks facilities, my overall concern is that we ensure quality interior living, working, and training conditions for all of our customers.

2. In order for the Army and our other customers to recruit and retain dedicated career professionals, excellent environments are needed to provide a high quality of life. Our customers and our own personnel spend a majority of their time in interior environments. Excellence in building interiors and furnishings is critical in meeting our customer's and our own functional and operations requirements. Excellent comprehensive interior design must be given high priority in the planning, programming, design, and implementation of our construction projects.

A handwritten signature in cursive script, reading "Arthur E. Williams".

ARTHUR E. WILLIAMS
Lieutenant General, USA
Commanding



DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CEMP-EA/CECW-PO

19 November 1993

COMMANDER'S POLICY MEMORANDUM #12

SUBJECT: Historic Preservation

1. The Army administers lands that contain significant historic and prehistoric properties reflecting our nation's architecture, engineering, historical events, and archeology. These properties reflect the Army's heritage in the protection of our country and the development of its infrastructure. The mission of the Army is changing, and the number of installations and facilities will be less in the future. The need to protect, preserve, and effectively reuse the historic properties for which the Army and USACE are stewards, is especially important as we build for the future.
2. Identification, evaluation, protection, preservation, and management of historic properties and cultural resources located on both military and civil works lands must be given high priority. Management of these properties in the spirit of stewardship will preserve them in a useful form for the benefit and inspiration of present and future generations. Division and district commanders should ensure that historic preservation goals are given just and equal consideration in planning, design, construction, and management of projects and in the execution of programs.

A handwritten signature in cursive script, reading "Arthur E. Williams".

ARTHUR E. WILLIAMS
Lieutenant General, USA
Commanding



DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:
CEMP-EA (1110)

13 MAY 1996

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Ensuring Full and Open Competition

1. In the past year, we have learned of instances throughout the Corps where restrictive specifications have been issued requiring proprietary builders' hardware. Specifically, locksets and lock cylinders with key-removable cores from the Best Lock Corporation are being specified to the exclusion of other manufacturers' equal products.
2. It is recognized that most installation engineers require the use of a single keying system throughout their area of responsibility. A single keying system for an entire installation can be conveniently and economically managed by use of lock cylinders with key-removable cores, a feature that until a few years ago was restricted by patent to the Best Lock Corporation. However, there are now a number of manufacturers (e.g., Arrow, Falcon, Sargent) that produce key-removable cores which are interchangeable with locksets and lock cylinders of other manufacturers. For example, Falcon cores operate in Best locks and can be master-keyed to Best grandmaster key systems (and vice versa), and most Falcon keyways are identical to Best keyways, allowing the keys to be cut on each other's key cutting equipment. This interchangeability allows the seamless extension of existing installation keying systems, regardless of manufacture, making the specification of proprietary systems typically unwarranted for this application.
3. As general policy, plans, drawings, specifications, standards, and purchase descriptions used for acquisitions shall state only the Government's actual minimum needs and will not unnecessarily restrict competition. Project hardware specifications will be based on the current edition of Corps of Engineers Guide Specification CEGS-08700, Builders' Hardware, and will not be written to require particular brand-names, products, or features of products peculiar to one manufacturer, unless:
 - a. The particular brand-names, products, or features are essential to the needs of the Government, and market research indicates that the items are not available from other companies, or that other companies' similar products do not meet, or can not be modified to meet, the project requirements; and

CEMP-EA (1110)

13 MAY 1996

SUBJECT: Ensuring Full and Open Competition

b. The authority to contract without providing for full and open competition is supported by a Justification and Approval (J&A) in accordance with the FAR. Early coordination with contracting and counsel is required to verify current requirements for this method of contracting.

4. Where extension of an integrated master keying system is required within an existing designated area, the name of the manufacturer whose locks are presently installed will be specified followed by a statement requiring integrated keying with that system. In this case, to allow bids from other manufacturers who can meet specified requirements, the project specifications must indicate that "or equal" systems are acceptable, must define the salient characteristics of the system needed by the Government, and must identify all known "equal" systems.

5. This memorandum has been coordinated with the Principal Assistant Responsible for Contracting, the Office of Chief Counsel, and the Directorate Construction Division. The CEMP-EA point of contact is Mr. Rick Dahnke, telephone (202) 761-1203.


KISUK CHEUNG, P.E.
Chief, Engineering Division
Directorate of Military Programs

DISTRIBUTION:
COMMANDER,

US ARMY ENGINEER DIVISION, LOWER MISSISSIPPI VALLEY, ATTN: CELMV-ED
US ARMY ENGINEER DIVISION, MISSOURI RIVER, ATTN: CEMRD-ED
US ARMY ENGINEER DIVISION, NEW ENGLAND, ATTN: CENED-ED
US ARMY ENGINEER DIVISION, NORTH ATLANTIC, ATTN: CENAD-EN
US ARMY ENGINEER DIVISION, NORTH CENTRAL, ATTN: CENCD-PE-ED
US ARMY ENGINEER DIVISION, NORTH PACIFIC, ATTN: CENPD-PE
US ARMY ENGINEER DIVISION, OHIO RIVER, ATTN: CEORD-PE
US ARMY ENGINEER DIVISION, PACIFIC OCEAN, ATTN: CEPD-ED
US ARMY ENGINEER DIVISION, SOUTH ATLANTIC, ATTN: CESAD-EN
US ARMY ENGINEER DIVISION, SOUTH PACIFIC, ATTN: CESP-ED
US ARMY ENGINEER DIVISION, SOUTHWESTERN, ATTN: CESWD-ED
(CONT)

CEMP-EA (1110)

13 MAY 1996

SUBJECT: Ensuring Full and Open Competition

DISTRIBUTION: (CONT)

COMMANDER,

US ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE, ATTN: CEHNC-ED
US ARMY ENGINEERING AND SUPPORT CENTER, TRANSATLANTIC,
ATTN: CETAC-DP

CF:

COMMANDER,

US ARMY ENGINEER DISTRICT, ALASKA, ATTN: CENPA-EN
US ARMY ENGINEER DISTRICT, ALBUQUERQUE, ATTN: CESWA-ED
US ARMY ENGINEER DISTRICT, BALTIMORE, ATTN: CENAB-EN
US ARMY ENGINEER DISTRICT, BUFFALO, ATTN: CENCB-PE
US ARMY ENGINEER DISTRICT, CHARLESTON, ATTN: CESAC-EN
US ARMY ENGINEER DISTRICT, CHICAGO, ATTN: CENCC-ED
US ARMY ENGINEER DISTRICT, DETROIT, ATTN: CENCE-ED
US ARMY ENGINEER DISTRICT, EUROPE, ATTN: CETAE-TD
US ARMY ENGINEER DISTRICT, FAR EAST, ATTN: CEPOF-ED
US ARMY ENGINEER DISTRICT, FORT WORTH, ATTN: CESWF-ED
US ARMY ENGINEER DISTRICT, GALVESTON, ATTN: CESWG-ED
US ARMY ENGINEER DISTRICT, HONOLULU, ATTN: CEPOH-ED
US ARMY ENGINEER DISTRICT, HUNTINGTON, ATTN: CEORH-ED
US ARMY ENGINEER DISTRICT, JACKSONVILLE, ATTN: CESAJ-EN
US ARMY ENGINEER DISTRICT, JAPAN, ATTN: CEPOJ-ED
US ARMY ENGINEER DISTRICT, KANSAS CITY, ATTN: CEMRK-ED
US ARMY ENGINEER DISTRICT, LITTLE ROCK, ATTN: CESWL-ED
US ARMY ENGINEER DISTRICT, LOS ANGELES, ATTN: CESPL-ED
US ARMY ENGINEER DISTRICT, LOUISVILLE, ATTN: CEORL-ED
US ARMY ENGINEER DISTRICT, MEMPHIS, ATTN: CELMM-ED
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US ARMY ENGINEER DISTRICT, NORFOLK, ATTN: CENAO-EN
US ARMY ENGINEER DISTRICT, OMAHA, ATTN: CEMRO-ED
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US ARMY ENGINEER DISTRICT, PITTSBURGH, ATTN: CEORP-ED
US ARMY ENGINEER DISTRICT, PORTLAND, ATTN: CENPP-PE
US ARMY ENGINEER DISTRICT, ROCK ISLAND, ATTN: CENCR-ED
(CONT)

CEMP-EA (1110)

13 MAY 1996

SUBJECT: Ensuring Full and Open Competition

CF: (CONT)

COMMANDER,

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US ARMY ENGINEER DISTRICT, SAN FRANCISCO, ATTN: CESPNE-PE

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US ARMY ENGINEER DISTRICT, SEATTLE, ATTN: CENPS-EN

US ARMY ENGINEER DISTRICT, ST. LOUIS, ATTN: CELMS-ED

US ARMY ENGINEER DISTRICT, ST. PAUL, ATTN: CENCS-ED

US ARMY ENGINEER DISTRICT, TULSA, ATTN: CESWT-EC

US ARMY ENGINEER DISTRICT, VICKSBURG, ATTN: CELMK-ED

US ARMY ENGINEER DISTRICT, WALLA WALLA, ATTN: CENPW-EN

US ARMY ENGINEER DISTRICT, WILMINGTON, ATTN: CESAW-EN

DIRECTOR, US ARMY CENTER FOR PUBLIC WORKS, ATTN: CECPW-E



DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CEMP-EA

26 NOV 1996

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Military and Federal Specifications and Standards (MIL-SPECS, FED-SPECS, MIL-STDS, and FED-STDS) Acquisition Reform

1. Reference CEMP-EA memorandum dated 22 July 1996, subject as above.
2. The reference was the most recent guidance we issued to USACE Chiefs of Engineering outlining our plan of action and requirements for complying with Secretary of Defense policy on the subject. Since that time, it has come to the attention of DoD that USACE has issued contracts based on the requirements of canceled (and occasionally nonexistent) MIL-SPECS/STDS. This practice is contrary to DoD and Army acquisition policy and must be changed.
3. As you know, we have a phased program underway to replace MIL and FED references in our guide specifications with industry standards and specifications. The 20 MIL-SPECS/STDS and 33 FED-SPECS remaining in the guide specifications are verified to be active documents and are exempted from established waiver process requirements by the USACE Standards Executive, pending the identification of suitable replacement references. Exempted documents may be used in USACE solicitations and contracts without the need for individual waiver approvals at the District level. The current list of exempted MIL/FED-SPECS/STDS is available on the TECHINFO web site at "<http://w2.hnd.usace.army.mil/techinfo>".
4. As in the past, Districts may add non-exempted MIL/FED-SPECS/STDS to USACE solicitations and contracts when the documents are needed to meet local or unique conditions or to accommodate an application not covered by a guide. However, to eliminate the potential for using canceled documents, Districts must verify that all non-exempted MIL and FED documents are active. When used, non-exempted documents must still be individually waived by District Chiefs of Engineering and reported through local Contracting offices to Headquarters (CEPR-O) for our quarterly status report to the Army Standards Executive.
5. The active status of MIL-SPECS/STDS may be verified through TECHINFO by clicking on "*Department of Defense Index of Specifications and Standards (DoDISS)*". This takes you to a DoD web site where you should click on "*Tips for Searching*".

CEMP-EA

SUBJECT: Military and Federal Specifications and Standards (MIL-SPECS, FED-SPECS, MIL-STDS, and FED-STDS) Acquisition Reform

DoDISS Online for guidance on using their database. The active status of FED-SPECS/STDS must be verified by telephoning the General Services Administration (GSA), Federal Supply Service, at (202) 619-8925. Currently, GSA's database is not online. To minimize the burden of this added requirement, every effort should be made to use the approved, active MIL and FED (and industry) documents in the guide specifications.

6. Exceptions to this policy apply where USACE is the contracting activity for non-Army customers or host nation governments and for contracts where a host nation government is the contracting activity. Under these circumstances, non-exempted MIL/FED-SPECS/STDS may be used without obtaining local waivers.

7. I request your continued full support in implementing these requirements effectively within your Command. My point of contact is Mr. Rick Dahnke, CEMP-EA, telephone (202) 761-1203, DSN 763-1203, e-mail "*rick.dahnke@inet.hq.usace.army.mil*". This memorandum has been coordinated internally with the Directorate of Civil Works and the Office of the Principle Assistant Responsible for Contracting.


KISUK CHEUNG, P.E.
USACE Standards Executive
Chief, Engineering Division
Directorate of Military Programs

DISTRIBUTION:

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CEMP-EA

SUBJECT: Military and Federal Specifications and Standards (MIL-SPECS, FED-SPECS, MIL-STDS, and FED-STDS) Acquisition Reform

CF:

COMMANDER,

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(CONT)

CEMP-EA

SUBJECT: Military and Federal Specifications and Standards (MIL-SPECS, FED-SPECS, MIL-STDS, and FED-STDS) Acquisition Reform

CF: (CONT)

COMMANDER,

US ARMY ENGINEER DISTRICT, SEATTLE, ATTN: CENPS-EN

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DIRECTOR, US ARMY CENTER FOR PUBLIC WORKS, ATTN: CECPW-E



DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CEMP-EA

22 JUL 1996

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Military and Federal Specifications and Standards (MIL-SPECS, FED-SPECS, MIL-STDS, and FED-STDS) Acquisition Reform

1. References:

a. CEPR-O memorandum dated 16 February 1995, subject: Release of the Master Action Plan (MAP).

b. CEMP-EA memorandum dated 20 September 1995, subject: Military Specifications (MIL-SPECS) and Military Standards (MIL-STDS) Acquisition Reform.

2. Reference 1.a. forwarded the USACE MAP to all USACE Commands outlining our plan of action and requirements for complying with Secretary of Defense policy on the subject initiative. Reference 1.b. provided USACE Chiefs of Engineering Divisions additional guidance on the subject based on our FY 95 efforts to minimize use of MIL-SPECS and MIL-STDS in the Corps of Engineers Guide Specifications (CEGS).

3. Last year, we eliminated 117 MIL-SPECS/STDS and 12 FED-SPECS/STDS from the CEGS (from initial totals of 137 and 168, respectively). This included cancellation of the only three construction-related MIL-STDS developed by USACE. This year, we concentrated on the remaining FED-SPECS and FED-STDS and eliminated an additional 101 of these references from the CEGS. "Elimination" of MIL/FED-SPECS/STDS resulted in either the complete removal of the documents without replacement; replacement with industry standards or specifications; replacement with industry standards or specifications and supplemental verbiage; or replacement with verbiage alone. This will be an ongoing process, and we will continue our efforts next fiscal year subject to the availability of funds.

4. A list of the 20 MIL-SPECS/STDS and 55 FED-SPECS/STDS that are still referenced in the CEGS is enclosed. These references are exempt from waiver process requirements outlined in the MAP which allows the documents to be used in USACE solicitations without the need for individual waiver approvals at the District level. This action is consistent with DoD and DA acquisition reform goals in that it avoids adverse increases in the cost of doing business while we identify or develop alternative reference documents suitable for use in the CEGS.

CEMP-EA

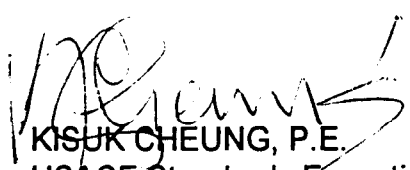
SUBJECT: Military and Federal Specifications and Standards (MIL-SPECS, FED-SPECS, MIL-STDS, and FED-STDS) Acquisition Reform

5. Individual waivers must still be issued by District Chiefs of Engineering for non-exempted MIL/FED-SPECS/STDS used in USACE solicitations. Waiver reports will continue to be maintained by Contracting for each solicitation and forwarded to Headquarters (CEPR-O) in accordance with the MAP. Exceptions to this policy apply where USACE is the contracting activity for non-Army customers or host nation governments and for contracts where a host nation government is the contracting activity. Under these circumstances, non-exempted MIL/FED-SPECS/STDS may be used without obtaining local waivers. I request your continued full support in implementing these requirements effectively within your Command.

6. A revised set of CEGS incorporating these reference changes has been uploaded on our TECHINFO web site at "<http://www.hnd.usace.army.mil>". Additionally, the revised CEGS are available on the Construction Criteria Base (CCB) web site at "<http://www.nibs.org/ccb>" and will be distributed on the next CD-ROM (Disk 37) edition of CCB.

7. This memorandum has been coordinated internally with the Office of the Principle Assistant Responsible for Contracting. The Directorate point of contact is Mr. Rick Dahnke, CEMP-EA, telephone (202) 761-1203, DSN 763-1203, facsimile (202) 761-8815, E-Mail "Rick.Dahnke@INET.HQ.USACE.Army.MIL".

Encl


KISUK CHEUNG, P.E.
USACE Standards Executive
Chief, Engineering Division
Directorate of Military Programs

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CEMP-EA

SUBJECT: Military and Federal Specifications and Standards (MIL-SPECS, FED-SPECS, MIL-STDS, and FED-STDS) Acquisition Reform

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(CONT)

CEMP-EA

SUBJECT: Military and Federal Specifications and Standards (MIL-SPECS, FED-SPECS, MIL-STDS, and FED-STDS) Acquisition Reform

COMMANDER,

US ARMY ENGINEER DISTRICT, OMAHA, ATTN: CEMRO-ED
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US ARMY ENGINEER DISTRICT, WILMINGTON, ATTN: CESAW-EN
US ARMY TRANSATLANTIC PROGRAMS CENTER (EUROPE), ATTN: CETAE-TD

DIRECTOR, US ARMY CENTER FOR PUBLIC WORKS, ATTN: CECPW-E

MILITARY AND FEDERAL SPECIFICATIONS AND STANDARDS (MIL-SPECS, FED-SPECS, MIL-STDS, AND FED-STDS) REFERENCED IN CEGS

The following MIL/FED-SPECS/STDS are approved for use in the CEGS in which they currently appear and otherwise as necessary. The listed documents will be removed from the CEGS when suitable replacement documents become available.

<u>FED-SPEC/STD</u>	<u>CEGS</u>		
		FS TT-P-1952	02580
		FS TT-P-19	09900
FS P-W-155	09900	FS TT-P-24	09900
FS AA-D-00600	08318	FS TT-P-28	09900
FS AA-V-00200	12520		11181
	12540		15846
FS GG-S-1340	11710	FS TT-P-29	09900
FS GG-S-1341	11710	FS TT-P-30	09900
FS GG-S-1343	11710	FS TT-P-31	09900
FS GG-S-1344	11710	FS TT-P-37	09900
FS RR-P-1352	10160	FS TT-P-38	09900
FS RR-T-650	09650	FS TT-P-645	09900
FS SS-S-1401	02579	FS TT-P-650	09900
	02592	FS TT-P-91	09900
	02594	FS TT-P-95	09900
FS SS-S-1614	02592	FS TT-S-001992	09900
FS SS-S-200	02579	FS TT-S-176	09900
	02592	FS TT-S-708	09900
FS SS-T-312	09650	FS TT-S-711	09900
	09675	FS TT-V-109	09900
	10270	FS TT-V-119	09900
FS TT-B-1325	02580	FS TT-V-121	09900
FS TT-C-535	09900	FS TT-V-51	09900
FS TT-C-542	09900	FS TT-V-85	09900
FS TT-C-555	09900	FS TT-V-86	09900
FS TT-E-487	09900	FS TT-W-572	02530
FS TT-E-489	09900		
FS TT-E-496	09900		
FS TT-E-505	09900	<u>MIL-SPEC/STD</u>	<u>CEGS</u>
FS TT-E-506	09900	MIL-C-20709	12335
FS TT-E-508	09900	MIL-DOD-C-24654	15355
FS TT-E-509	09900		13206
FS TT-E-545	09900		13210
FS TT-F-1098	09900	MIL-F-24385	15355
FS TT-P-001984	09900	MIL-H-29181	13977
FS TT-P-002119	09900	MIL-H-43905	13977
FS TT-P-102	02530	MIL-M-81380	11145
	09900		13202
FS TT-P-1510	09900		
FS TT-P-1511	09900		

18 July 1996

MILITARY AND FEDERAL SPECIFICATIONS AND STANDARDS (MIL-SPECS, FED-SPECS, MIL-STDS, AND FED-STDS) REFERENCED IN CEGS

MIL-N-52747	11145
MIL-N-52748	11145
MIL-N-5877	11145
MIL-P-24441/GEN	13206
	13210
MIL-P-29206	11145
MIL-P-43607	13977
MIL-STD 188 124	16650
MIL-STD 188 125	16650
MIL-STD 220	16650
MIL-STD 705	16263
MIL-STD 1691	15405
MIL-STD 2202	13810
MIL-STD 2203	13810
	13945
MIL-STD 24484	11145

MILITARY AND FEDERAL SPECIFICATIONS AND STANDARDS (MIL-SPECS, FED-SPECS, MIL-STDS, AND FED-STDS) REFERENCED IN CEGS

The following MIL/FED-SPECS/STDS are approved for use in the CEGS in which they currently appear and otherwise as necessary. The listed documents will be removed from the CEGS when suitable replacement documents become available.

<u>FED-SPEC/STD</u>	<u>CEGS</u>		
		FS TT-P-1952	02580
		FS TT-P-19	09900
FS P-W-155	09900	FS TT-P-24	09900
FS AA-D-00600	08318	FS TT-P-28	09900
FS AA-V-00200	12520		11181
	12540		15846
FS GG-S-1340	11710	FS TT-P-29	09900
FS GG-S-1341	11710	FS TT-P-30	09900
FS GG-S-1343	11710	FS TT-P-31	09900
FS GG-S-1344	11710	FS TT-P-37	09900
FS RR-P-1352	10160	FS TT-P-38	09900
FS RR-T-650	09650	FS TT-P-645	09900
FS SS-S-1401	02579	FS TT-P-650	09900
	02592	FS TT-P-91	09900
	02594	FS TT-P-95	09900
FS SS-S-1614	02592	FS TT-S-001992	09900
FS SS-S-200	02579	FS TT-S-176	09900
	02592	FS TT-S-708	09900
FS SS-T-312	09650	FS TT-S-711	09900
	09675	FS TT-V-109	09900
	10270	FS TT-V-119	09900
FS TT-B-1325	02580	FS TT-V-121	09900
FS TT-C-535	09900	FS TT-V-51	09900
FS TT-C-542	09900	FS TT-V-85	09900
FS TT-C-555	09900	FS TT-V-86	09900
FS TT-E-487	09900	FS TT-W-572	02530
FS TT-E-489	09900		
FS TT-E-496	09900		
FS TT-E-505	09900	<u>MIL-SPEC/STD</u>	<u>CEGS</u>
FS TT-E-506	09900	MIL-C-20709	12335
FS TT-E-508	09900	MIL-DOD-C-24654	15355
FS TT-E-509	09900		13206
FS TT-E-545	09900		13210
FS TT-F-1098	09900	MIL-F-24385	15355
FS TT-P-001984	09900	MIL-H-29181	13977
FS TT-P-002119	09900	MIL-H-43905	13977
FS TT-P-102	02530	MIL-M-81380	11145
	09900		13202
FS TT-P-1510	09900		
FS TT-P-1511	09900		

18 July 1996

MILITARY AND FEDERAL SPECIFICATIONS AND STANDARDS (MIL-SPECS, FED-SPECS, MIL-STDS, AND FED-STDS) REFERENCED IN CEGS

MIL-N-52747	11145
MIL-N-52748	11145
MIL-N-5877	11145
MIL-P-24441/GEN	13206
	13210
MIL-P-29206	11145
MIL-P-43607	13977
MIL-STD 188 124	16650
MIL-STD 188 125	16650
MIL-STD 220	16650
MIL-STD 705	16263
MIL-STD 1691	15405
MIL-STD 2202	13810
MIL-STD 2203	13810
	13945
MIL-STD 24484	11145



DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CEMP-EA/CECW-EP

13 DEC 1996

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Metric Design Policy - Specifications for Modular Metric Products

1. In the recently passed Savings in Construction Act of 1996, P.L. 104-289 (110 Stat. 3411, enclosure 1), Congress imposed new restrictions on use of "hard metric" specifications for concrete masonry units (CMU) and recessed lighting fixtures (RLF).

a. The law allows the use of the 100 mm building module for metric design. However, CMU and RLF may **not** be specified only in hard metric versions unless the "agency head" determines that hard metric version is --

(1) necessary for repair or replacement (**or**, for RLF only, the predominant voluntary industry consensus standards include the use of hard metric for the RLF items specified) **or**

(2) needed to "coordinate dimensionally" into 100 millimeter building modules and their total installed price is estimated to be equal to or less than the total installed price of using non-metric sized products, i.e., inch-pound CMU and RLF products.

b. Hard metric, which is also referred to as modular metric, means measurements or products that need to physically change to new sizes to fit into the internationally accepted 100 mm building design module. Hard metric does not include measurements or products that are simply relabeled in metric units but do not physically change in size to be used in a metric building module. These relabeled measurements or products are called soft metric. Of the thousands of building products, only a few, such as brick, CMU, RLF, ceiling tiles, gypsum wallboard, rigid insulation, etc., are modular products; and the new statute applies only to CMU and RLF. Total installed price is defined as the price of purchasing and installing the product/material including all cutting/trimming necessary to fit them with other building components in a 100 mm building module.

2. Effective immediately, our policy is to allow general contractors the use of either hard metric or inch-pound substitute (soft metric) CMU and RLF in our metric projects so that they can make the selection based on the total installed price. Therefore, when

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SUBJECT: Metric Design Policy - Specifications for Modular Metric Products

specifying CMU and RLF in metric projects, construction documents for bids or proposals must ensure that the following steps are taken.

a. For Project Drawings -

(1) Project drawings should indicate concrete block walls only by wall thickness in metric dimensions. Location and details of wall openings, horizontal or vertical breaks, joints, corners, horizontal or vertical coursing, rebar spacing, etc. that are critical for the project should be identified as required by the Corps of Engineers Guide Specifications on Masonry (CEGS 04200) on contract documents. As always, decision to use CMU or alternative product as load-bearing structural system or wall material should be based on engineering and life cycle cost considerations.

(2) Suspended ceiling systems should be laid out on a 100 mm module using modular metric RLF dimensions. Suspended ceiling system components are T-bars, wall moldings, hangers, acoustical ceiling tile, recessed air diffusers, grills and registers, and RLF. Contractors should be allowed to use either hard metric or inch-pound products for all components of the suspended ceiling system. Location and details of access panels and other penetrations through ceilings that are critical for the project should be identified as required by CEGS 09510, titled Acoustical Ceilings. In addition, the specific design criteria and the assumptions for lighting should be noted on the drawings to enable the contractor to layout inch-pound suspended ceiling system. As always, selection of ceiling systems and components will be based on engineering and life cycle cost considerations.

b. For Project Specifications - Project specifications for CMU and RLF should be edited to include both the hard metric and inch-pound values for these two products. Also, a note to the contractors be added in the CMU and RLF specifications to advise them of their choice of either metric or inch-pound products, and for RLF only, the choice of substituting all suspended ceiling components.

c. Request for Waiver from this policy, i.e., request for specifying only hard metric CMU or RLF in a metric project must be submitted to Commander, US Army Corps of Engineers, ATTN: CEMP-EA, 20 Massachusetts Ave., N.W., Washington, DC 20314-1000, for approval.

3. Other modular metric products will be specified in accordance with the enclosed guidance (enclosure 2). This guidance requires that modular metric products should be specified: (1) where it is required to fit the 100 mm metric module, (2) where it is

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commercially available and there is competition, i.e., can be obtained from more than one source, and (3) the product's total installed cost is reasonable. Designers should conduct market surveys to determine the availability of modular metric products before specifying them. Specified products have to be commercially available, but not necessarily an off-the-shelf item. A detailed written total installed cost analysis is not required for specifying modular metric products except CMU and RLF.


4. The law also requires each agency that awards construction contracts to designate a senior agency official to serve as a construction metrication ombudsman. The designated individual will be responsible for reviewing and responding to metric related complaints concerning Federal building projects from prospective bidders, subcontractors, suppliers or their authorized representatives. HQUSACE will advise when the metric ombudsman is appointed.

5. The law applies to construction contracts awarded and solicitations issued on or after 10 January 1997. The law does not apply to contracts awarded and solicitations issued on or before 9 January 1997. The law has a 10-year sunset provision and applies to all Federal building or construction projects within the United States and its territories, but excludes any construction projects or buildings owned or controlled by a State government, local government, Indian tribe, or any private entity.

6. The point of contact (POC) for Military Programs is Mr. Ami Ghosh, CEMP-EA, telephone (202) 761-8603, fax (202) 761-8815, and for Civil Works is Mr. Jack Bickley, CECW-EP, telephone (202) 761-8892, fax (202) 761-4534. This memorandum has been coordinated with the Office of the Principle Assistant Responsible for Contracting (CEPR) and the Office of the Chief Counsel (CECC-C).

FOR THE COMMANDER:

2 Encls


PHILLIP R. ANDERSON
Brigadier General, USA
Director of Military Programs

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(See Page 4)

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SUBJECT: Metric Design Policy - Specifications for Modular Metric Products

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PUBLIC LAW 104-289

104th Congress -- 2nd Session

H.R. 2779

104 P.L. 289; 110 Stat. 3411
1996 Enacted H.R. 2779; 104 Enacted H.R. 2779

DATE: OCT. 11, 1996 -- PUBLIC LAW 104-289

SYNOPSIS: An Act

To provide for appropriate implementation of the Metric Conversion Act of 1975 in Federal construction projects, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Savings in Construction Act of 1996".

SEC. 2. FINDINGS.

The Congress finds the following:

(1) The Metric Conversion Act of 1975 was enacted in order to set forth the policy of the United States to convert to the metric system. Section 3 of that Act requires that each Federal agency use the metric system of measurements in its procurement, grants, and other business-related activities, unless that use is likely to cause significant cost or loss of markets to United States firms, such as when foreign competitors are producing competing products in non-metric units.

(2) In accordance with that Act and Executive Order 12770, of July 25, 1991, Federal agencies increasingly construct new Federal buildings in round metric dimensions. As a result, companies that wish to bid on Federal construction projects increasingly are asked to supply materials or products in round metric dimensions.

(3) While the Metric Conversion Act of 1975 currently provides an exemption to metric usage when impractical or when such usage will cause economic inefficiencies, amendments are warranted to ensure that the use of specific metric components in metric construction projects do not increase the cost of Federal buildings to the taxpayers.

ENCLOSURE 1

SEC. 3. DEFINITIONS.

Section 4 of the Metric Conversion Act of 1975 (15 U.S.C. 205c) is amended--

(1) by striking "and" at the end of paragraph (3);

(2) by striking "Commerce." in paragraph (4) and inserting "Commerce;"; and

(3) by inserting after paragraph (4) the following:

"(5) 'full and open competition' has the same meaning as defined in section 403(6) of title 41, United States Code;

"(6) 'total installed price' means the price of purchasing a product or material, trimming or otherwise altering some or all of that product or material, if necessary to fit with other building components, and then installing that product or material into a Federal facility;

"(7) 'hard-metric' means measurement, design, and manufacture using the metric system of measurement, but does not include measurement, design, and manufacture using English system measurement units which are subsequently reexpressed in the metric system of measurement;

"(8) 'cost or pricing data or price analysis' has the meaning given such terms in section 304A of the Federal Property and Administrative Services Act of 1949 (41 U.S.C. 254b); and

"(9) 'Federal facility' means any public building (as defined under section 13 of the Public Buildings Act of 1959 (40 U.S.C. 612) and shall include any Federal building or construction project--

"(A) on lands in the public domain;

"(B) on lands used in connection with Federal programs for agriculture research, recreation, and conservation programs;

"(C) on or used in connection with river, harbor, flood control, reclamation, or power projects;

"(D) on or used in connection with housing and residential projects;

"(E) on military installations (including any fort, camp, post, naval training station, airfield, proving ground, military supply depot, military school, or any similar facility of the Department of Defense);

"(F) on installations of the Department of Veteran Affairs used for hospital or domiciliary purposes; or

"(G) on lands used in connection with Federal prisons, but does not include (i) any Federal building or construction project the exclusion of which the President deems to be justified in the public interest, or (ii) any construction project or building owned or controlled by a State government, local government, Indian tribe, or any private entity."

SEC. 4. IMPLEMENTATION IN ACQUISITION OF FEDERAL FACILITIES.

(a) The Metric Conversion Act of 1975 (15 U.S.C. 205 et seq.) is amended by inserting after section 13 the following new section:

"SEC. 14. IMPLEMENTATION IN ACQUISITION OF CONSTRUCTION SERVICES AND MATERIALS FOR FEDERAL FACILITIES.

"(a) In General.-- Construction services and materials for Federal facilities shall be procured in accordance with the policies and procedures set forth in chapter 137 of title 10, United States Code, section 2377 of title 10, United States Code, title III of the Federal Property and Administrative Services Act of 1949 (41 U.S.C. 251 et seq.), and section 3(2) of this Act. Determination of a design method shall be based upon preliminary market research as required under section 2377(c) of title 10, United States Code, and section 314B(c) of the Federal Property and Administrative Services Act of 1949 (41 U.S.C. 264b(c)). If the requirements of this Act conflict with the provisions of section 2377 of title 10, United States Code, or section 314B of the Federal Property and Administrative Services Act of 1949, then the provisions of 2377 or 314B shall take precedence.

"(b) Concrete Masonry Units.-- In carrying out the policy set forth in section 3 (with particular emphasis on the policy set forth in paragraph (2) of that section) a Federal agency may require that specifications for the acquisition of structures or systems of concrete masonry be expressed under the metric system of measurement, but may not incorporate specifications, that can only be satisfied by hard-metric versions of concrete masonry units, in a solicitation for design or construction of a Federal facility within the United States or its territories, or a portion of said Federal facility, unless the head of the agency determines in writing that--

"(1) hard-metric specifications are necessary in a contract for the repair or replacement of parts of Federal facilities in existence or under construction upon the effective date of the Savings in Construction Act of 1996; or

"(2) the following 2 criteria are met:

"(A) the application requires hard-metric concrete masonry units to coordinate dimensionally into 100 millimeter building modules; and

"(B) the total installed price of hard-metric concrete masonry units is estimated to be equal to or less than the total installed price of using non-hard-metric concrete masonry units. Total installed price estimates shall be based, to the extent available, on cost or pricing data or price analysis, using actual hard-metric and non-hard-metric offers received for comparable existing projects. The head of the agency shall include in the writing required in this subsection an explanation of the factors used to develop the price estimates.

"(c) Recessed Lighting Fixtures.-- In carrying out the policy set forth in section 3 (with particular emphasis on the policy set forth in paragraph (2) of that section) a Federal agency may require that specifications for the acquisition of structures or systems of recessed lighting fixtures be expressed under the metric system of measurement, but may not incorporate specifications, that can only be satisfied by hard-metric versions of recessed lighting fixtures, in a solicitation for design or construction of a Federal facility within the United States or its territories unless the head of the agency determines in writing that--

"(1) the predominant voluntary industry consensus standards include the use of hard-metric for the items specified; or

"(2) hard-metric specifications are necessary in a contract for the repair or replacement of parts of Federal facilities in existence or under construction upon the effective date of the Savings in Construction Act of 1996; or

"(3) the following 2 criteria are met:

"(A) the application requires hard-metric recessed lighting fixtures to coordinate dimensionally into 100 millimeter building modules; and

"(B) the total installed price of hard-metric recessed lighting fixtures is estimated to be equal to or less than the total installed price of using non-hard-metric recessed lighting fixtures. Total installed price estimates shall be based, to the extent available, on cost or pricing data or price analysis, using actual hard-metric and non-hard-metric offers received for comparable existing projects. The head of the agency shall include in the writing required in this subsection an explanation of the factors used to develop the price estimates.

"(d) Limitation.-- The provisions of subsections (b) and (c) of this section shall not apply to Federal contracts to acquire construction products for the construction of facilities outside of the United States and its territories.

"(e) Expiration.-- The provisions contained in subsections (b) and (c) of this section shall expire 10 years from the effective date of the Savings in Construction Act of 1996."

SEC. 5. OMBUDSMAN.

Section 14 of the Metric Conversion Act of 1975, as added by section 4 of this Act, is further amended by adding at the end the following new subsection: "(f) Agency Ombudsman.-- (1) The head of each executive agency that awards construction contracts within the United States and its territories shall designate a senior agency official to serve as a construction metrication ombudsman who shall be responsible for reviewing and responding to complaints from prospective bidders, subcontractors, suppliers, or their designated representatives related to--

"(A) guidance or regulations issued by the agency on the use of the metric system of measurement in contracts for the construction of Federal buildings; and

"(B) the use of the metric system of measurement for services and materials required for incorporation in individual projects to construct Federal buildings. The construction metrication ombudsman shall be independent of the contracting officer for construction contracts.

"(2) The ombudsman shall be responsible for ensuring that the agency is not implementing the metric system of measurement in a manner that is

impractical or is likely to cause significant inefficiencies or loss of markets to United States firms in violation of the policy stated in section 3(2), or is otherwise inconsistent with guidance issued by the Secretary of Commerce in consultation with the Interagency Council on Metric Policy while ensuring that the goals of the Metric Conversion Act of 1975 are observed.

"(3) The ombudsman shall respond to each complaint in writing within 60 days and make a recommendation to the head of the executive agency for an appropriate resolution thereto. In such a recommendation, the ombudsman shall consider--

"(A) whether the agency is adequately applying the policies and procedures in this section;

"(B) whether the availability of hard-metric products and services from United States firms is sufficient to ensure full and open competition; and

"(C) the total installed price to the Federal Government.

"(4) After the head of the agency has rendered a decision regarding a recommendation of the ombudsman, the ombudsman shall be responsible for communicating the decision to all appropriate policy, design, planning, procurement, and notifying personnel in the agency. The ombudsman shall conduct appropriate monitoring as required to ensure the decision is implemented, and may submit further recommendations, as needed. The head of the agency's decision on the ombudsman's recommendations, and any supporting documentation, shall be provided to affected parties and made available to the public in a timely manner.

"(5) Nothing in this section shall be construed to supersede the bid protest process established under subchapter V of chapter 35 of title 31, United States Code."

SEC. 6. EFFECTIVE DATE AND MISCELLANEOUS PROVISIONS.

(a) Effective Date.-- This Act and the amendments made by this Act shall take effect 90 days after the date of enactment of this Act.

(b) Savings Provisions.-- This Act shall not apply to contracts awarded and solicitations issued on or before the effective date of this Act, unless the head of a Federal agency makes a written determination in his or her sole discretion that it would be in the public interest to apply one or more provisions of this Act or its amendments to these existing contracts or solicitations.

Speaker of the House of Representatives.

Vice President of the United States and President of the Senate.

GUIDANCE FOR SPECIFYING MODULAR METRIC CONSTRUCTION PRODUCTS

1. REFERENCES.

a. Federal Register, Vol. 61 No. 96, 16 May 1996, 24761 - Federal Agency Guidance for the Acquisition of Modular Metric Construction Products

b. Public Law 104-289, Savings in Construction Act of 1996 (110 Stat. 3411), which specifically applies to only two modular products - concrete masonry units (CMU) and recessed light fixtures (RLF).

2. PURPOSE. This document provides information on USACE metrication progress and guidelines for using modular metric, also known as hard metric, construction products in metric projects.

3. BACKGROUND.

a. In 1988, Federal law mandated the metric system as the preferred system of measurement in the United States (US) and required that metric be used in all Federal procurement, grants, and business-related activities, to the extent feasible, by September 30, 1992. The law is intended to pursue metrication for increased cost-effectiveness and productivity of U.S. business and to provide greater access to markets while avoiding any undue burden on US firms. Executive order 12770, *Metric Usage in Federal Government Programs*, dated 25 July 1991, required federal agencies to develop specific timetables and milestones for transition to the metric system.

b. USACE has made substantial progress in the adoption of metric measurements. All Corps of Engineers Guide Specifications (CEGS) and all active Department of the Army (DA) standard design packages (11 designs) for military projects have already been converted to the metric system. Current USACE metrication policy is to design all FY 97 and future military projects using the metric system of measurement. While recommended, USACE policy regarding metrication is not mandatory for small O&MA projects, projects with Non-Federal sponsors or projects that use non-metric as-built drawings extensively where the use of the metric system may not be economically feasible. Currently we have 65 metric military projects ---totaling approximately \$1.13 billion under design or construction.

c. The metrication process for products involves "soft metric conversion" and "hard

metric conversion". Dimensions for the vast majority of construction products need only be "soft-converted" for use in metric construction projects. A soft metric conversion means that the physical dimensions of the product remain unchanged while the measurement units used to describe and specify the product are changed to metric units. To make metric construction succeed, a small percentage of products need their physical dimensions changed or "hard-converted" to fit them into the internationally recognized building module of 100 millimeters (mm). These products are frequently referred to as modular products or hard metric products.

Modular construction products are brick, CMU (also known as concrete block) components of the suspended ceiling systems such as acoustical ceiling tiles, recessed lighting fixtures (RLF) and air diffusers, raised access flooring, wallboard, plywood, particleboard, and rigid insulation. According to the guidelines in reference 1.a., a modular construction product in a hard metric size shall only be specified in a Federal construction project if the product's application requires it to "dimensionally coordinate" into 100 mm building module, the product is found to be competitively available, and the product's total installed cost is reasonable. Total installed cost is the cost of purchasing and installing the product including all cutting/trimming necessary to fit them with other building components in a 100 mm building module. Use of modular products avoids unnecessary jobsite cutting or trimming fostering cost-effective, logical design and quality construction.

4. GUIDELINES FOR SOME SPECIFIC MODULAR CONSTRUCTION PRODUCTS.

a. Steel Reinforcing Bar. The actual diameter size of steel reinforcing bar is not required to change in order to coordinate dimensionally into the 100 mm building module. Therefore, the American Society for Testing and Materials (ASTM) has recently adopted new metric bar standards which are based on soft conversion of existing inch-pound bars.

b. Brick. Many common brick sizes are within a millimeter or two of metric modular sizes and nearly all can fit within 100 mm module by slightly varying mortar joint widths to 10 mm.

c. Concrete Masonry Units (CMU). The new legislation which becomes effective 10 January 1997 (reference 1b) allows federal agencies to specify only hard metric versions of CMU unless (1) the block will be required to fit together into the 100 mm building module, and (2) the "agency head" determined (prior to contract award) that the total installed price of hard-metric CMU is estimated to be equal to or less than the total installed price of using inch-pound (soft metric) CMU. To comply with the new

law, the majority of the Federal agencies including USACE, elected to let the construction contractor use either metric or substitute inch-pound blocks in our metric projects without compromising design requirements. Construction documents for bids or proposals, issued after 10 Jan 97, will incorporate this policy. It is the general contractor, not the government, who will make the decision whether metric or inch-pound concrete block offers the most efficient and cost-effective solution in each situation. If the general contractor decides to use inch-pound CMU, the following provisions should be met so that quality is not jeopardized: (1) mortar joint width should be no less than 10 mm, (2) horizontal reinforcements, if required, should be placed between the joints only, (3) no cut block should be put at the end of wall, and (4) if the vertical reinforcement and the masonry block webs do not match, the block must be cut to adjust, rebars will not be cut, bent or eliminated to correct the condition.

d. Suspended Ceiling Systems. Components for suspended ceiling systems are T-bars, hangers, ceiling tile, recessed lighting fixtures (RLF), and recessed air diffusers. All components are available in modular metric sizes and are priced competitively with their inch-pound counterparts with the exception of recessed lighting fixtures. In this case also, for compliance with the above mentioned law, USACE and other Federal agencies elected to let the construction contractor make the decision whether metric or inch-pound recessed lighting fixtures should be used. Construction documents for bids or proposals, issued after 10 January 1997, will incorporate this policy. If the general contractor decides to use inch-pound RLF, he will be allowed to use substitute inch-pound products for all suspended ceiling components provided they do not interfere with other design requirements.

e. Raised Access Flooring. Raised access flooring is a specialty item used primarily in computer rooms and other areas where provision for under floor cabling is desirable. A number of manufacturers make raised access flooring to fit the 100 mm module, but there may be a cost premium for small orders and longer delivery times for most orders. Metric raised access flooring will be specified if costs are comparable to inch-pound access flooring and procurement lead times are acceptable.

f. Wallboard. Wallboard is formed in continuous sheets of variable widths and cut to specified lengths. A variety of manufacturers make wallboard to fit the 100 mm module, but there may also be a cost premium for small orders and longer delivery times for most orders. While the use of metric wallboard is desirable in metric projects, its use is not mandatory on small projects or small orders if project duration or cost will increase. Where framing spacing is specified to fit modular metric construction, the contractor should not be allowed to cut or trim the sealed edges of inch-pound (soft metric) wallboard sheets to fit into the metric frame spacing.

g. Plywood and Particleboard. Like wallboard, wood-based sheet products such as plywood and particleboard can be produced in modular metric sizes. There may be a premium for small orders and longer delivery times for most orders. When framing spacing is specified to fit modular metric construction, the construction contractor may make the decision whether metric sheets or trimmed inch-pound sheets offer the most efficient and cost-effective solution in each situation.

h. Rigid Insulation. Rigid insulation is used on exterior walls and as a roof underlay. Currently this product is available only in inch-pound sizes and must be cut to fit metric framing spacing. On roofs, the product is usually laid over a rigid substrate that allows any sheet size to be used. Where the sheets are applied directly to metric framing spacing (400 or 600 mm), the width must be trimmed by the contractor.

5. ADDITIONAL GUIDANCE AND INFORMATION ON METRICATION.

a. Further guidance on the federal acquisition of modular metric construction products is available from the Construction Metrication Council of the National Institute of Building Sciences, 1201 L Street, N.W., Suite 400, Washington D.C. 20005, Tel. 202-289-7800. The Construction Metrication Council issues a bimonthly newsletter, *Metric in Construction* which provides private and public support for the metrication of Federal construction and promotes the adoption and use of the metric system of measurement.

b. HQUSACE Architectural *Gargoyle* is an informal publication that is issued by CEMP-A. This publication provides information and news of interest about metrication along with other hot topics. *Gargoyle* can be found on CEMP-A web site at URL http://www.hq.usace.army.mil/cemp/e/a/cemp_ea.htm.

c. If you have any questions regarding metrication you should first contact your district metric point-of-contact (POC). If you do not know who your metric POC is, contact your district architectural POC. The list of architectural POC can be accessed from the CEMP-A web site. Quite often the district metric POC and the architectural POC are the same individual. The metric or architectural POC will be able to assist you in obtaining the answer.

d. Request for additional guidance or information concerning metrication should be addressed to Commander, US Army Corps of Engineers, ATTN: CEMP-A, 20 Massachusetts Ave., N.W., Washington, DC 20314-1000, or the appropriate engineering discipline POC at HQUSACE, ATTN: CEMP-ET.



DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CEMP-EA

2 February 1996

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Metric Design Policy for Military Construction

1. In accordance with Public Law and by Executive Order, all construction criteria and standards as of 1 January 1992, and all feasible project designs for new facilities as of 1 January 1994, must be developed using the metric system of measurement.
2. As a feasibility test, selected FY93, 94, and 95 military projects were designed in metric, and numerous FY96 projects were, or are being, done in metric. Based on the success of these projects and the success of other Federal agencies, on 21 November 1994, we issued the policy that all FY97 and future military projects were required to use the metric system.
3. Currently, in CONUS, we have 10 military metric projects totaling \$134 million under construction (including various phases of the Pentagon rehab), and 80 projects totaling \$1.5 billion actively under design, with no adverse effects or "metric premiums" reported. There are 25 Civil Works metric planning studies or reconnaissance reports underway and 28 projects totaling \$400 million under design.
4. Our criteria have been under conversion since 1987 when we published architectural and engineering instructions with dual units. Since then, all new and revised USACE publications, guide specifications, standard designs, etc. have been converted to, or developed, in metric. Our military guide specifications have been in metric since October 1993 and all the Department of the Army standard design packages have also been converted, or are being converted.
5. Our metric conversion has been closely coordinated with the construction industry. Where the industry has committed to a "hard" metric product, we must specify and use that in our designs. Where the industry is yet undecided, inch-pound products should be used with a "soft" conversion when design efficiency or architectural treatments are not compromised. True, the availability of some metric products is less than their conventional counterparts which requires more research during design, and more looking and scheduling during construction. Experience has shown that the key to a successful metric job is aggressive project management and administration.


CEMP-EA

SUBJECT: Metric Design Policy for Military Construction

6. Metric is doable and we need to get on with it. The design and construction industry, and many of the suppliers of building materials are prepared to go metric, or have gone metric. It is time for our design and technical staffs to overcome any fears they may have and convince our customers that metric is doable and here to stay, not only because of the laws and the EO, but because it is good for the United States. We also owe our customers the assurance that, while it may seem new and strange, metric in and by itself will not increase the cost of their facilities, and it should not be used as a scapegoat to justify cost overruns or bid busts with little or no evidence as back-up.

7. I expect each one of you to ensure that lessons-learned from our metric experiences, both good and bad, are shared with us here in Washington so we can share them with the entire Corps. In return, my staff will continue to work the Construction Metrication Council and share the experiences of other Federal agencies with you.

FOR THE COMMANDER:



ALBERT J. GENETTI, JR.
Major General, USA
Director of Military Programs

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DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CEMP-EA

2 February 1996

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Metric Design Policy for Military Construction

1. In accordance with Public Law and by Executive Order, all construction criteria and standards as of 1 January 1992, and all feasible project designs for new facilities as of 1 January 1994, must be developed using the metric system of measurement.
2. As a feasibility test, selected FY93, 94, and 95 military projects were designed in metric, and numerous FY96 projects were, or are being, done in metric. Based on the success of these projects and the success of other Federal agencies, on 21 November 1994, we issued the policy that all FY97 and future military projects were required to use the metric system.
3. Currently, in CONUS, we have 10 military metric projects totaling \$134 million under construction (including various phases of the Pentagon rehab), and 80 projects totaling \$1.5 billion actively under design, with no adverse effects or "metric premiums" reported. There are 25 Civil Works metric planning studies or reconnaissance reports underway and 28 projects totaling \$400 million under design.
4. Our criteria have been under conversion since 1987 when we published architectural and engineering instructions with dual units. Since then, all new and revised USACE publications, guide specifications, standard designs, etc. have been converted to, or developed, in metric. Our military guide specifications have been in metric since October 1993 and all the Department of the Army standard design packages have also been converted, or are being converted.
5. Our metric conversion has been closely coordinated with the construction industry. Where the industry has committed to a "hard" metric product, we must specify and use that in our designs. Where the industry is yet undecided, inch-pound products should be used with a "soft" conversion when design efficiency or architectural treatments are not compromised. True, the availability of some metric products is less than their conventional counterparts which requires more research during design, and more looking and scheduling during construction. Experience has shown that the key to a successful metric job is aggressive project management and administration.

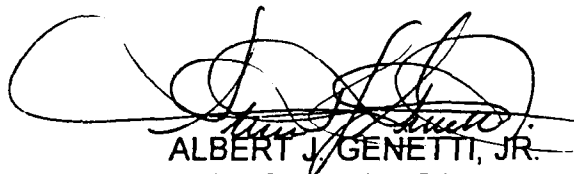
CEMP-EA

SUBJECT: Metric Design Policy for Military Construction

6. Metric is doable and we need to get on with it. The design and construction industry, and many of the suppliers of building materials are prepared to go metric, or have gone metric. It is time for our design and technical staffs to overcome any fears they may have and convince our customers that metric is doable and here to stay, not only because of the laws and the EO, but because it is good for the United States. We also owe our customers the assurance that, while it may seem new and strange, metric in and by itself will not increase the cost of their facilities, and it should not be used as a scapegoat to justify cost overruns or bid busts with little or no evidence as back-up.

7. I expect each one of you to ensure that lessons-learned from our metric experiences, both good and bad, are shared with us here in Washington so we can share them with the entire Corps. In return, my staff will continue to work the Construction Metrication Council and share the experiences of other Federal agencies with you.

FOR THE COMMANDER:



ALBERT J. GENETTI, JR.
Major General, USA
Director of Military Programs

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SUBJECT: Metric Design Policy for Military Construction

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DEPARTMENT OF THE ARMY
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WASHINGTON, D.C. 20314-1000

EIRS BULLETIN
94-11

REPLY TO
ATTENTION OF:

CEMP-EA

2 Nov 94

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Metric Design Policy for Military Construction

1. In accordance with the Metric Conversion Act of 1975 (Public Law 94-168) as amended by the Omnibus Trade and Competitiveness Act of 1988 (Public Law 100-418), Executive Order (EO) 12770 dated July 25, 1991, and the metric milestone schedule developed in accordance with EO 12770 by the Construction Subcommittee of the Metrication Operating Committee of the Interagency Council on Metric Policy (memorandum dated November 5, 1991), all feasible project designs for new facilities must be developed using the metric system of measurement as of January 1, 1994.
2. As a feasibility test, various FY 93, 94, and 95 military projects in CONUS were identified as pilots and designed using the metric system. In accordance with ER 1110-345-100, 15 February 1994, all feasible FY 96 military projects were identified to be designed in metric. As a result, approximately 50 military projects in CONUS are currently being designed or constructed in metric with no adverse effects.
3. The Architectural and Engineering Instructions (AEI), *Design Criteria*, has included metric measurements since 13 March 1987. All new and revised USACE publications, guide specifications, standard designs, or other design and construction criteria (as of 1 January 1992) have been, or are being, developed using the metric system of measurement. All Corps of Engineers Guide Specifications (CEGS) for military projects have already been converted, and all standard design packages have been, or are being, converted to the metric system.
4. Based on the above, effective immediately the policy is to design all FY 97 and future military projects using the metric system of measurement. Design directives for some FY 97 projects have already been issued. The implementation of this new policy is considered to have *routine application* as defined by ER 1110-345-100, i.e., the policy applies to all future projects and current projects if received prior to 35 percent concept design completion. Previous designs passed the 35 percent design stage that have been shelved, or completed designs for projects that may be deferred to FY 97 or beyond, need not be redesigned solely for the sake of meeting this new policy. While recommended, this policy is not mandatory for small O&MA projects where the use of the metric system may not be economically feasible.

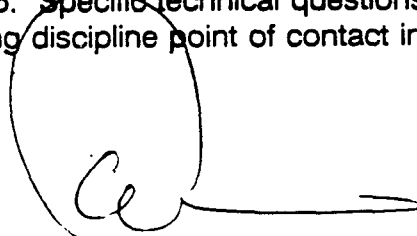
CEMP-EA
SUBJECT: Metric Design Policy for Military Construction

EIRS BULLETIN
94-11

5. Since the DD Form 1391 Processor cannot currently develop forms using the metric system of measurement, all DD Form 1391 project scopes will need to be manually converted.

6. Technical guidance for developing project designs using the metric system of measurement is provided at enclosure 1. Requests for additional guidance or information concerning this policy should be addressed to Commander, US Army Corps of Engineers, ATTN: CEMP-EA, 20 Massachusetts Ave., N.W., Washington, DC 20314-1000. The overall point of contact for the directorate is Ami Ghosh, telephone (202) 272-8603, facsimile (202) 272-8815. Specific technical questions may also be addressed to the appropriate engineering discipline point of contact in the directorate.

FOR THE COMMANDER:



Encl

PAT M. STEVENS IV
Major General, USA
Director of Military Programs

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US ARMY NATIONAL GUARD BUREAU

GUIDANCE FOR METRIC PROJECT DESIGNS

1. BACKGROUND.

The Metric Conversion Act of 1975 designated the metric system (SI) as the preferred system of measurement in the United States. The Omnibus Trade and Competitive-ness Act of 1988 includes a requirement for each Federal agency to use the metric system of measurement. Executive Order 12770 requires the use of the metric system in Federal Government procurement, grants and other business related activities. It is Corps of Engineers policy to design and construct all new Army facilities in metric. This document along with the referenced material provides the guidance and instructions necessary for the preparation and development of project designs incorporating metric measurements.

2. REFERENCES AND RESOURCES.

a. ER 1110-1-4, *Metric Measurements in USACE Publication Media*, dated 31 March 1994, requires all new or revised USACE criteria, guidance and other documents to use the metric system of measurement.

b. ER 1110-3-113, *Department of the Army Facilities Standardization Program*, dated 27 September 1993, requires all standard design packages to be developed on sheet size A1 (594 mm by 841 mm) using the metric system of measurement.

c. All Corps of Engineer Guide Specification (CEGS) for military construction have been revised to include dual units of measurement, with metric as the primary unit followed by inch-pound (IP) units in parentheses. CEGS section 01030, *Metric Measurements* explains the use of the metric system of measurement for those projects specified in metric and the additional notes provide background information and explain metric unit and inch-pound unit options available in SPECSINTACT. The converted CEGS are currently available on TECHINFO (CEHND electronic bulletin board), SPECSINTACT, and the Construction Criteria Base (CCB).

d. With the support of the U.S. Army Engineer Division, Huntsville, one EXPORTABLE (video) metric training course has been developed, and a second course is being developed. The first course provides an introduction to the metric system, a basic understanding of metric units of measure, and also provides the specific rules of reading and writing in metric. This course is intended to benefit all

USACE team members. One copy of this course was distributed to each MSC on 11 March 1994, and one copy was distributed to every USACE district command and technical center, laboratory, and FOA on 11 May 1994. The second course will address some specifics of design using the metric system of measurement, and is intended for design and construction professionals.

- e. OM 15-1-15, *HQUSACE Metric Committee*, dated 1 April 1993, officially established a HQUSACE Metric Committee to oversee the implementation of the metric system in planning, design, construction, and other associated USACE activities.
- f. ER 1110-345-100, *Design Policy for Military Construction*, dated 15 February 1994, requires the use of metric units.
- g. ER 1110-345-700, *Design Analysis*, is being updated to require the use of metric units. Guidance concerning design analysis in this document will be used in the interim.
- h. ER 1110-345-710, *Drawings*, is being updated to require the use of metric units. Guidance concerning drawings in this document will be used in the interim.
- i. ER 1110-345-720, *Construction Specifications*, is being updated to require the use of metric units. Guidance concerning specifications in this document will be used in the interim.
- j. ASTM E 380-92, *Standard Practice for Use of the International System of Units (SI) (the Modernized Metric System)*. To obtain a copy, write or call ASTM at 1916 Race Street, Philadelphia, PA 19103; (215) 299-5585.
- k. ASTM E 621-84 (Reapproved 1991), *Standard Practice for the Use of Metric (SI) Units in Building Design and Construction (Committee E-6 Supplement to E 380)*. To obtain a copy, write or call ASTM at 1916 Race Street, Philadelphia, PA 19103; (215) 299-5585.
- l. *Metric Guide for Federal Construction, First Edition*, published by the National Institute of Building Sciences (NIBS). This publication contains an introduction to the metric system, metric conversion tables, guidance for metric specifications and drawings, and provides a listing of metric references. To obtain a copy, write or call the Publications Department, NIBS, at 1201 L. Street, N.W., Suite 400, Washington, DC 20005; (202) 289-7800.

m. *Metric Design Guide*, dated May 1994, published by the Federal Services Administration. This publication is on the NIBS Construction Criteria Base (CCB) CD-ROM system.

n. Federal Standard 376B, *Preferred Metric Units for General Use by the Federal Government*, dated 27 January 1993, published by General Services Administration

o. *Architectural Graphics Standards*, published by The American Institute of Architects, which provides information concerning metric design calculations, preferred metric dimensions for certain materials, detailed metric drawing practice standards and examples, and metric conversion tables for all design disciplines.

p. Construction Criteria Base (CCB). Information about metric construction materials and their manufacturers is now available from the CCB system under the General Services Administration (GSA) criteria.

q. Architectural and Engineering Instructions (AEI), *Design Criteria*, current version dated 3 July 1994, which contains metric units of measure.

3. GENERAL REQUIREMENTS.

a. Design analyses shall be prepared in metric. Where computer programs or technical references are used, the metric version of the program or reference is preferred and should be used. Where metric versions are not readily available or practical, that portion of the design analyses based on the non-metric program or reference may use IP units. In these cases, the final values that are to be placed in the contract documents shall be converted to their metric equivalent in the design analyses prior to use in project drawings or specifications.

b. Project drawings will be prepared on standard sheet size A1 (594 mm by 841 mm). A standard title block will be used that runs vertically on the right-hand side of the sheet. A CADD file of this standard is available from the Commander, US Army Engineer Division, Huntsville, ATTN: CEHND-ED-CS (Mr. Riffel), P.O. Box 1600, Huntsville, AL 35807-4301, telephone (205) 955-5220 FAX: (205) 955-3089. Large master planning projects, etc., may use standard sheet size A0 (1189 mm by 841 mm) with the same style of title block.

c. The primary design module should be in metric, e.g., 100 mm (in lieu of 4 inches), 600 mm (in lieu of 2 feet), 1200 mm (in lieu of 4 feet), and 400 mm on center (in lieu of 16 inches on center).

d. Only preferred metric scales should be used, i.e., 1:1 for full scale, 1:5 (in lieu of a 3" or 4" scale), 1:10 (in lieu of a 2", 1-1/2", or 1" scale), 1:20 (in lieu of a 1/2" or 3/4" scale), 1:50 (in lieu of a 1/4" scale), 1:100 (in lieu of an 1/8" scale), 1:200 (in lieu of a 1/16" scale), 1:500 (in lieu of a 1/32" scale, or a 1" = 40' or 50' scale), 1:1000 (in lieu of 1" = 80' or 100'). Larger area maps or plans may require scales such as 1:2000, 1:5000, 1:10 000, 1:25 000, 1:50 000 (in lieu of 1" = 1 mile), or even 1:100 000 (in lieu of 1/2" = 1 mile). A graphic scale is required on all drawings.

e. Drawings up to 1:200 will use millimeters (mm) and include a note that all units are millimeters (mm) unless otherwise indicated. Numbers up to five places are acceptable, e.g., 96 000. Drawings over 1:200 (site and location drawings for example) will be in meters (m) and include a note that all units are in meters (m) unless otherwise indicated. Centimeters (cm) shall not be used either on drawings or in written or printed matter. Unless specifically indicated otherwise, metric dimensions only will be shown on project drawings.

f. Unit designations and conversions shall be in accordance ASTM E 621-84 as modified by the *Metric Guide for Federal Construction*, unless specifically indicated otherwise.

g. For project specifications and other printed data, the number should be between 1 and 1000 with the appropriate prefix for the units. This is in compliance with ASTM E621; however, there are exceptions, especially when dealing with squared or cubed units and the rule should be applied using good engineering judgement.

h. All CEGS for military construction have been revised to include metric designations. When printing from the SPECSINTACT system the designer must select either SI or IP units. When the SI option is selected, the appropriate units for a metric project will be printed. In general, only a metric unit will be shown for field dimensional data (such as height of a thermostat above the floor) and hard metric products or products available using metric designations. Dual units will be shown when a hard metric or metric designated product is not available or when the IP units are needed for clarity or to trace back to referenced industry standards, such as ASTM or ASME, that do not include appropriate metric designations. In these cases, the metric unit is shown first followed by the appropriate IP value in parenthesis; however, the IP value governs. In a few cases, use of metric dimensions may be inappropriate and only an IP value may be shown.

i. Guide Specification CEGS-01030 contains information on the implementation of metric for the benefit of the construction contractor and shall be included in all metric projects.

4. SPECIFIC REQUIREMENTS.

a. All piping, pipe fittings, and valves shall be indicated on project drawings in millimeters (mm). The metric designation shall be as indicated in Table I, Pipe, Valves and Fittings, IP and Metric Designations. A table similar to this will be placed on the project drawings. The project specifications will show piping, pipe fittings and valves in dual units. The IP designations can be used to trace back to the referenced industry standards.

b. For most applications degree Celsius ($^{\circ}\text{C}$) shall be shown as the unit for temperature. However, heat transfer units shall be shown in kelvin (K) to be consistent with most of the published literature. For example, thermal resistance (R value) should be shown as square meters kelvin/watt ($\text{m}^2\cdot\text{K}/\text{W}$) and thermal conductivity (k value) as watts/meter kelvin [$\text{W}/(\text{m}\cdot\text{K})$].

c. The metric unit for volumetric flow rate shall be liters/second (L/s). Where the codes and standards used in the technical area are dual units or metric and typically use liters/minute, the project drawings and specifications may also use liters/minute. The metric unit for mass flow rate shall be kilograms/second (kg/s).

d. Where compliance with a safety or other code requirements are necessary, the metric dimension may be an exact conversion of the IP value or a conservatively rounded conversion of a maximum or minimum IP value.

e. For ductwork and other sheet metal applications, the metric equivalents for galvanized sheet, uncoated steel, stainless steel and aluminum sheet thickness shall be from the nominal millimeter thickness shown in SMACNA "HVAC Duct Construction Standards" 1985 Edition.

f. Degree-days in project specifications or other written project documents will be shown in dual units. For example:

2222 Celsius degree days (4000 fahrenheit degree days)

The basis for the degree days will also be shown with the metric value ($^{\circ}\text{C}$) shown first followed by the IP base temperature in parenthesis ($^{\circ}\text{F}$).

g. Sizes shown in American Wire Gauge (AWG) will not be given a metric equivalent. The sizes will remain AWG.

5. DISCIPLINE SPECIFIC REQUIREMENTS. Requirements for the use of metric measurements as applicable to specific disciplines or technologies are indicated in the appendices.

TABLE I
PIPE, VALVES AND FITTINGS IP AND METRIC DESIGNATIONS

Nominal Pipe Size (inches)	Metric Identification millimeter (mm)		Nominal Pipe Size (inches)	Metric Identification millimeter (mm)
1/8	6		8	200
3/16	7		10	250
1/4	8		12	300
3/8	10		14	350
1/2	15		16	400
5/8	18		18	450
3/4	20		20	500
1	25		24	600
1-1/4	32		28	700
1-1/2	40		30	750
2	50		32	800
2-1/2	65		36	900
3	80		40	1000
3-1/2	90		44	1100
4	100		48	1200
4-1/2	115		52	1300
5	125		56	1400
6	150		60	1500

NOTE: The metric designation for all pipe, valves and fittings over 60 inches will be 25 mm per inch.

APPENDIX A
DISCIPLINE SPECIFIC REQUIREMENTS
MECHANICAL AND FIRE PROTECTION ENGINEERING

1. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Handbook of Fundamentals, 1989, Chapter 35 shall also be used as a reference in developing metric project designs.
2. All control equipment and devices including all thermostats, meters, gauges, etc., operating ranges, setpoints, actuator signals and pressures, and similar control system components and installation requirements shall be shown on project drawings and in project specifications as IP units only. TM 5-815-3, Heating Ventilating and Air Conditioning (HVAC) Control Systems, CEGS 15950, Heating, Ventilating and Air Conditioning (HVAC) Control Systems and CEGS 15951, Direct Digital Control for HVAC are presently being revised. The requirement to show these systems in IP units only may be changed when revisions to these documents are completed and printed. Field dimensional data, piping, valve sizes and similar shall be shown in metric as previously indicated.
3. Factory fabricated storage tanks for fuel storage and similar applications shall use liters (L) as the metric measurement. Site fabricated storage tanks (over 50,000 gallons) shall use cubic meters (m^3) as the metric measurement.
4. Pascals (Pa) and kilopascals (kPa) shall be used as the metric measurement for both positive (above atmospheric) and negative (vacuum) pressures. If not completely clear from the usage or if it is subject to misinterpretation, the term negative or positive pressure shall be used.

ENGINEERING AND DESIGN

Metric Design Policy for Military Construction:

a. Problem: ER 1110-345-100, *Design Policy for Military Construction*, dated 15 February 1994, paragraph 6.g. currently states:

Metric. In accordance with the Metric Conversion Act of 1975 (Public Law 94-168) as amended by the Omnibus Trade and Competitiveness Act of 1988 (Public Law 100-418), Executive Order (EO) 12770 dated July 25, 1991, and the metric milestone schedule developed in accordance with EO 12770 by the Construction Subcommittee of the Metrication Operating Committee of the Interagency Council on Metric Policy (memorandum dated November 5, 1991), all designs for new facilities (as of January 1, 1994) shall be developed using the metric system of measurement, to the extent that the use is economically feasible. The use of the metric system of measurement is not required where such use would be impractical or cause significant inefficiencies or loss of markets to United States firms.

This policy is in conflict with the new metric design policy for military construction that was issued by HQUSACE (CEMP-EA) memorandum, subject as above, which was signed by MG Pat. M. Stevens, Director of Military Programs on 21 November 1994 (see following pages).

b. Probable Solution: Paragraph 6.g. of ER 1110-345-100 will be revised to read as follows:

Metric. In accordance with the Metric Conversion Act of 1975 (Public Law 94-168) as amended by the Omnibus Trade and Competitiveness Act of 1988 (Public Law 100-418), Executive Order (EO) 12770 dated July 25, 1991, and the metric milestone schedule developed in accordance with EO 12770 by the Construction Subcommittee of the Metrication Operating Committee of the Interagency Council on Metric Policy (memorandum dated November 5, 1991), all designs (as of January 1, 1994) shall be developed using the metric system of measurement.

c. Implementation: The implementation of this new policy is considered to have ***routine application*** as defined by ER 1110-345-100.

APPENDIX B
DISCIPLINE SPECIFIC REQUIREMENTS
ELECTRICAL ENGINEERING

1. All conduits, tubing and fittings shall be indicated on project drawings in millimeters (mm). The metric designation shall be as indicated in Table B-I, NEMA APPROVED METRIC SIZE DESIGNATIONS(ELECTRICAL CONDUITS). A table similar to this will be placed on the project drawings. The project specifications will show conduits, tubing and fittings in dual units. The IP designations can be used to trace back to the referenced standards.
2. Degree Celsius ($^{\circ}\text{C}$) shall be used as the metric equivalent of fahrenheit ($^{\circ}\text{F}$).
3. Conductor sizes shown in AWG or MCM will not be given an SI equivalent. Conductor sizes will remain AWG or MCM until availability of wire manufactured to ASTM B682 standard metric conductor sizes, is determined. Hard metric sizes per ASTM B682 are substantially larger than the corresponding AWG or MCM sizes.
4. All HVAC control equipment and devices including all thermostats, meters, gauges, etc., operating ranges, setpoints, components and installation requirements shall be shown on project drawings and in project specifications as IP units only. The requirement to show these systems in IP units only may be changed when revisions to current HVAC criteria documents are completed and printed.
5. Lighting Fixtures; Use hard metric fixture sizes for lay-in type when using a hard metric ceiling grid. Many domestic manufacturers currently manufacture or can produce hard metric fixture sizes. Most common sizes are 600 by 600 mm and 600 by 1200 mm. These hard metric sizes do not apply to fluorescent tube lengths as they are not manufactured in hard metric. The hard metric fixtures are manufactured to accommodate the 609 mm (24-inch) and 1218 mm (48-inch) length tubes. Caution must be used to not take an older design based on the inch-pound system merely change to hard metric dimensions because new requirements may substantially change a lighting layout from previous ones.

TABLE B-1
NEMA APPROVED METRIC SIZE
DESIGNATIONS
(ELECTRICAL CONDUIT)

USA TRADE SIZE	METRIC SIZE DESIGNATIONS
1/2"	16 mm
3/4"	21 mm
1"	27 mm
1-1/4"	35 mm
1-1/2"	41 mm
2"	53 mm
2-1/2"	63 mm
3"	78 mm
3-1/2"	91 mm
4"	103 mm
5"	129 mm
6"	155 mm

Conduit Cross sections: Electrical conduit is similar to piping; it is produced in "soft" decimal inch dimensions but is identified in nominal inch sizes. Neither metallic nor nonmetallic conduit will change size; they will be relabeled in metric as shown in the above table. These metric designations were assigned by the National Electrical Manufacturers Association.